THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIII. No. 563.] LONDON, FEBRUARY 24, 1874. [26TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1823. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES. CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 80, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
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GENUINE TORBAY PAINT
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FOUR PRIZE MEDALS.
WORKS: BRIXHAM, TORBAY.
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
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PATENTEE & CONTRACTING GAS ENGINEER
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ERECTING AND REMODELLING
GAS-WORKS OF ANY EXTENT,
AT HOME OR ABROAD.
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JOSEPH COWEN and CO.,
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Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and other OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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69, UPPER THAMES STREET;
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5, CHARLES STREET, SOHO; and
15, SOHO SQUARE,
} LONDON
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
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J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
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WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
ESTABLISHED 1830.

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CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
SUGAR, SALTPETRE, AND ALL KINDS OF PANS.
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J. & W. ROMANS, Consulting Gas Engineers and Coal Factors, of Edinburgh and London, CONTRACT for supplying any quantity of COAL and CANNEL.
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Analysis, prices, and other information will be forwarded on application to their Offices, 8, Forth Street, EDINBURGH; 1, Walbrook, Mansion House, LONDON, or to the "Crown Wharf," Thomas Street, Limehouse, LONDON, where stocks of house, steam, and gas coal are always on hand.
Coal, machinery, fire goods, &c., shipped to all parts of the world.

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DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
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NATIONAL STANDARD GASOMETERS
For the English Government, and for the Government of the Netherlands;
MAKERS OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government;
AND MANUFACTURERS OF
IMPROVED
DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
236, GEORGE STREET, GLASGOW; AND 15, MARKET STREET, MANCHESTER.

G. G. and Co. have just received the only Medal awarded for Gas-Meters at the Vienna International Exhibition.

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Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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DANIEL HOWARD,

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(ESTABLISHED IN 1765,)

BOILER AND GASHOLDER WORKS,

Westbromwich, near Birmingham.

MANUFACTURER OF TELESCOPE AND SINGLE GASHOLDERS,

WROUGHT & CAST IRON TANKS

FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS,

And all kinds of GAS APPARATUS.

Wrought-Iron Roofs, Bridges, and Girders; Steam, Hot Water, and Range Boilers; Tanks, Cisterns, &c.,

And all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, and ESTIMATES FURNISHED.

VICKARYS AND ROBERTSON,

Late JOHN VICKARY,

ESTABLISHED 1840,

GAS ENGINEERS, CONTRACTORS, IRON AND BRASS FOUNDERS,

WEST OF ENGLAND ENGINEERING WORKS, EXETER.

GASHOLDERS AND TANKS,

Retorts, Retort-Fittings, Condensers, Scrubbers, Purifiers, Station-Meters, Governors, Rack and Screw Valves. Gas and Water Mains always in Stock.

STEAM-ENGINES, EXHAUSTERS, SHAFTING AND GEARING, &c.

GAS-FITTINGS,

Including Chandeliers, Pendants, Hall Lamps, Brackets, Star and Sun Lights of all designs.

WET & DRY GAS-METERS,

Combining most recent improvements in principle and manufacture; upwards of 200,000 already in work, giving highest satisfaction.
(A guarantee of five years given with every Meter.)

PLUMBERS WORK, including Lift and Force Pumps; Cocks for Gas and Water and Steam; Brass Fittings.

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THE MEDAL FOR 1862.

The only Prize Medal awarded for TUBES & FITTINGS.

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MANUFACTURERS OF

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GAS-FITTERS TOOLS, VALVES, COCKS, &c.

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MANUFACTURERS OF

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PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

Drawings, Specifications, and Estimates supplied on application.

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COOMBS WOOD PATENT TUBE-WORKS.

OLD HILL, near DUDLEY,

MANUFACTURERS OF

HOWARD'S PATENT IMPROVED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

Also ORDINARY WELDED WROUGHT-IRON TUBES and FITTINGS,

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

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IN THE

PURIFICATION OF ILLUMINATING GAS,

BY

Spence's Patent Dry Copperas,

The only Purifying Material which removes, by one process, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of four years at some of the largest Gas-Works in the Kingdom.

TESTIMONIALS SENT ON APPLICATION.

SPENCE BROTHERS CHEMICAL COMPANY, LIMITED,

VICTORIA CHEMICAL WORKS, ASHTON NEW ROAD, BRADFORD, MANCHESTER,

Manufacturers of SPENCE'S PATENT DRY COPPERAS; GREEN COPPERAS;

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SULPHATE OF AMMONIA, GREY AND BROWN; SULPHURIC ACID; MUDIE'S DISINFECTANT, &c.

CONTRACTORS FOR THE PURCHASE OF SPENT OXIDE.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE WORKS.

Established

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JOSEPH CLIFF & SON,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

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FIRE GOODS, and Salt-Glazed Drain-Pipes.

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Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

THE IMPERIAL METER COMPANY, LIMITED,

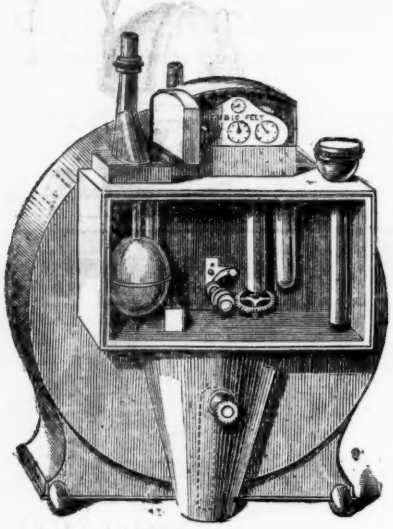
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

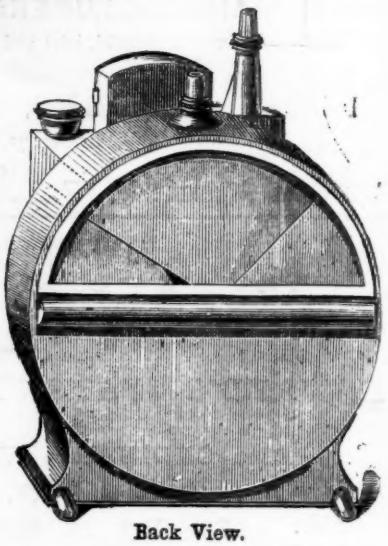
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



Back View.

I. **This Meter is more simple in construction than the common non-compensating Meter.**
II. **An unvarying water-line is maintained.**
III. **No amount or kind of pressure will cause it to "flood."**
IV. **It is practically unaffected by "tilting."**
V. **The friction is less than in any other Meter; and**
VI. **It will last for twelve months without requiring to be refilled.**

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

SPECIAL ATTENTION

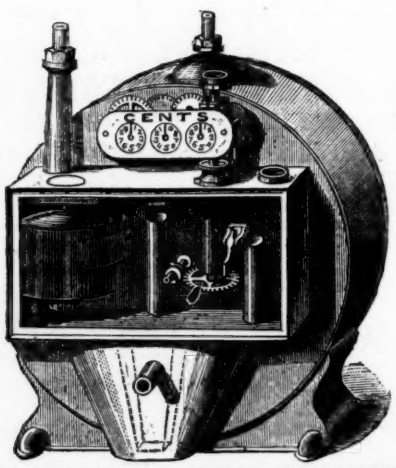
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



THE IMPERIAL WET GAS-METER.
Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

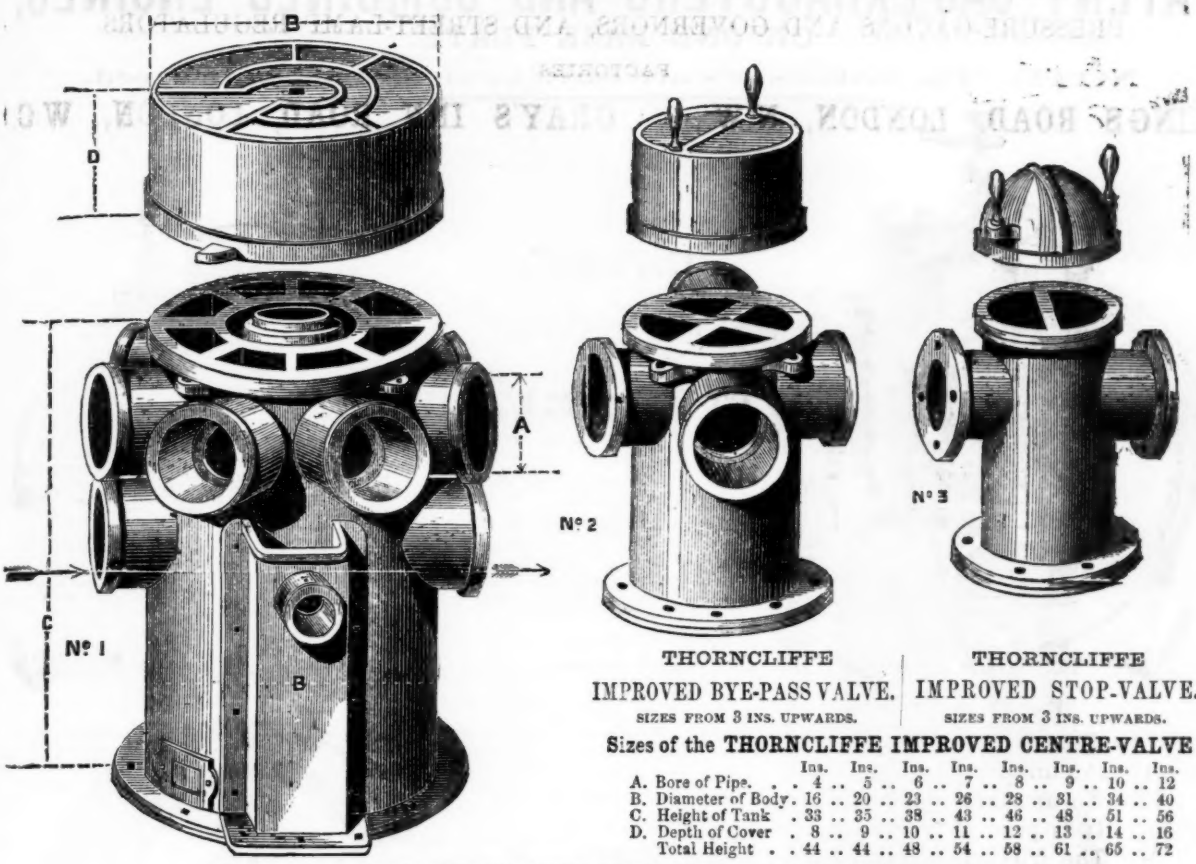
W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.

IMPROVED CENTRE-VALVES.



THORNCLIFFE IMPROVED BYE-PASS VALVE. SIZES FROM 3 INS. UPWARDS.

THORNCLIFFE IMPROVED STOP-VALVE. SIZES FROM 3 INS. UPWARDS.

Sizes of the THORNCLIFFE IMPROVED CENTRE-VALVE

	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
A. Bore of Pipe. . .	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..	12
B. Diameter of Body.	16 ..	20 ..	23 ..	26 ..	28 ..	31 ..	34 ..	40
C. Height of Tank .	33 ..	35 ..	38 ..	43 ..	46 ..	48 ..	51 ..	56
D. Depth of Cover .	8 ..	9 ..	10 ..	11 ..	12 ..	13 ..	14 ..	16
Total Height . .	44 ..	44 ..	48 ..	54 ..	58 ..	61 ..	65 ..	72

In all cases the Covers are cast heavy enough to resist any required pressure.

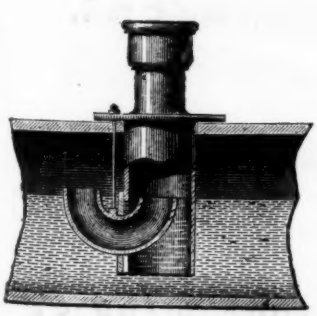
The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

N., C., and Co. also Manufacture and Erect

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.



Messrs. N. C. & Co. are also the Sole Agents for

HAWKINS' PATENT SELF-ACTING DIP-PIPES.

These Patent Self-Acting Dip-Pipes are rapidly coming into general use by gas companies. By their use the whole of the pressure caused by the old kind of Dip-Pipes is entirely removed, therefore the yield of gas per ton of coal is considerably increased. They also act as a perfect safeguard against the deposit of carbon (or scurf) inside the retorts.

A saving of fuel is effected, and the wear and tear to the retorts greatly diminished.

They are also perfectly Self-Acting, they being regulated solely by the gas. They cannot get out of repair, and when once fixed, will last as long as the old kind, and can be easily adjusted should the hydraulic main sink; they can also be worked with advantage where there is no exhauster.

Testimonials can be had from Herbert Unwin, Esq., engineer of the Sheffield United Gaslight Company and the Penistone Gas Company. At both these companies works they have been in constant operation for several months. Further testimonials can be had on application to the Patentee, J. G. Hawkins, Effingham Street Gas-Works, Sheffield.

For Prices, &c., apply to

Messrs. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, near SHEFFIELD.

GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

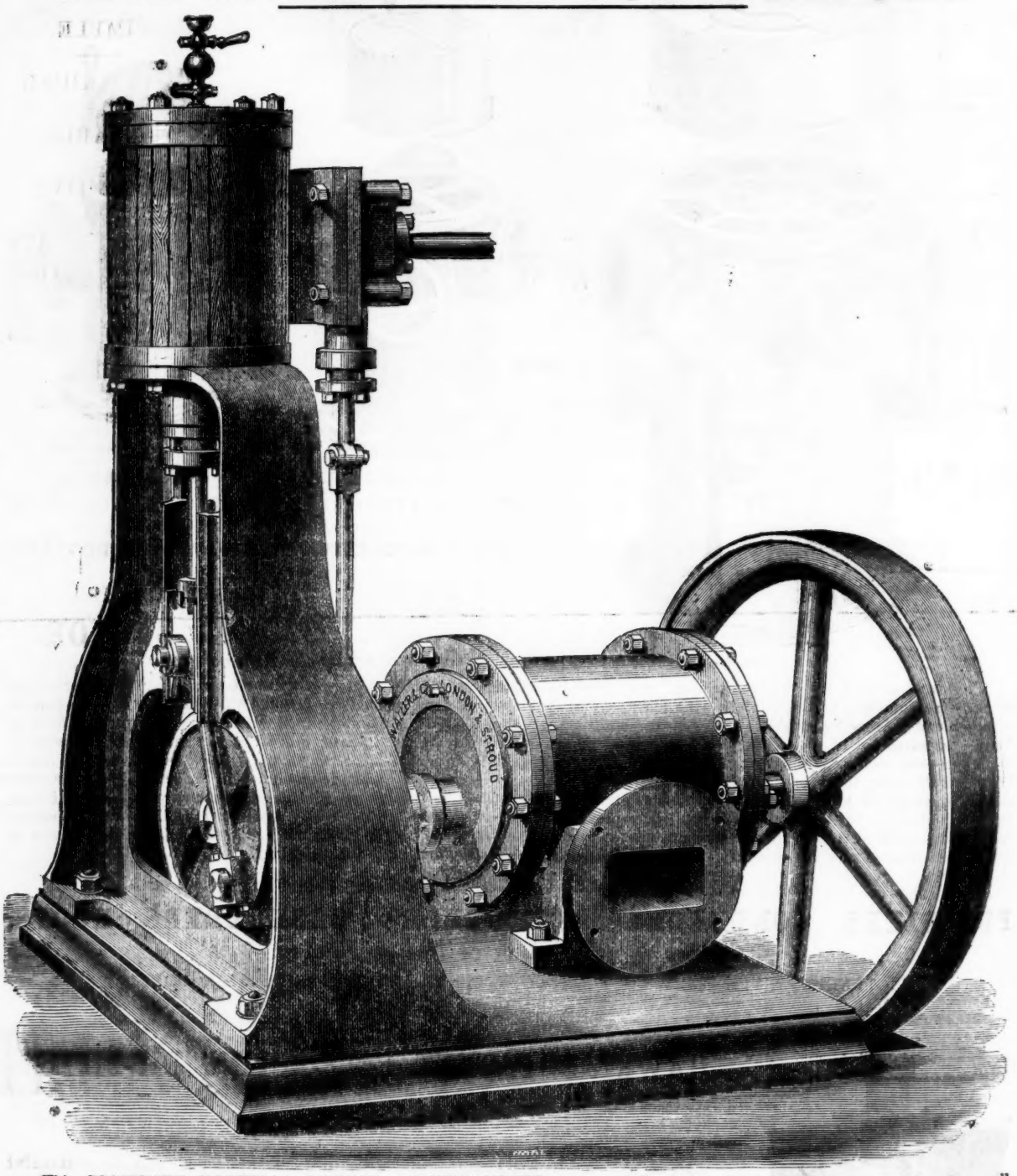
SOLE MAKERS OF

Beale's Improved

PATENT GAS-EXHAUSTERS AND COMBINED ENGINES,

ON ONE BASE PLATE.

NOTE.—The Exhausters are extra large for moderate speed.



This COMBINED VERTICAL ENGINE and EXHAUSTER was specially designed by G. WALLER AND Co. for small works, where space is an object, and is applicable for Exhausters from 1000 to 15,000 per hour. This is the *only* Engine and Exhauster **complete on one Base Plate,** requiring only one foundation.

NOTE.—They are sent away complete, and are easily fixed.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.,

AND AT

STROUD, GLOUCESTERSHIRE.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

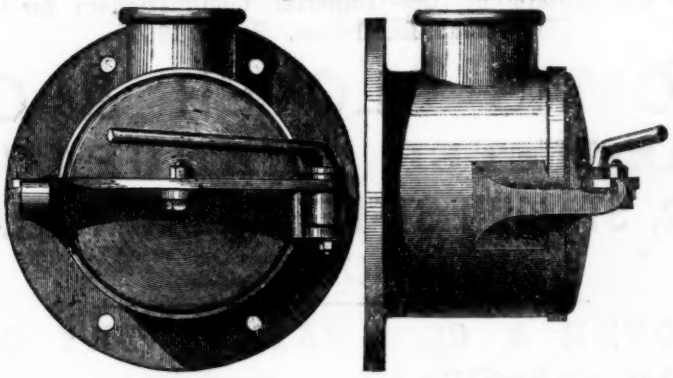
HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 10,000 IN USE.

NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW. SIDE VIEW.

SIMPLE.

ECONOMICAL

DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).	The West Ham Gas Company.	The Salford Corporation Gas-Works.	The Carmarthen Gas-Works.
,, Gaslight Company, Bow Common.	,, Imperial Gaslight Company.	,, Rochdale Corporation Gas-Works.	,, Merthyr Tydûl Gas-Works.
,, London Gaslight Company.	,, Gas-Works, Arsenal, Woolwich.	,, Liverpool United Gas-Works.	,, Ystrad Gas-Works.
,, Independent Gaslight Company.	,, Commercial Gas Company.	,, Birkenhead Gas-Works.	,, St. Alban's Gas-Works.
,, Phœnix Gaslight Company.	,, Alliance and Dublin Gas-Works.	,, Birmingham Gas-Works.	,, Over Darwen Gas-Works.
,, South Metropolitan Gaslight Co.	,, Edinburgh Gas-Works.	,, Nottingham Gas-Works.	,, Aylesbury Gas-Works.
	,, Manchester Corporatn. Gas-Works.	,, Newcastle-on-Tyne Gas-Works.	,, Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

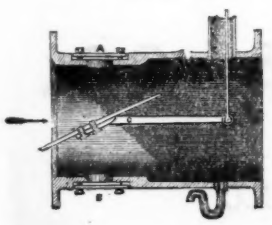
The following important Testimonial, among others, has been given:—

"*The Gaslight and Coke Company. Engineer's Office, 6, Westminster Chambers, Nov.* 14, 1871.

"Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them, and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) "F. J. Evans."

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

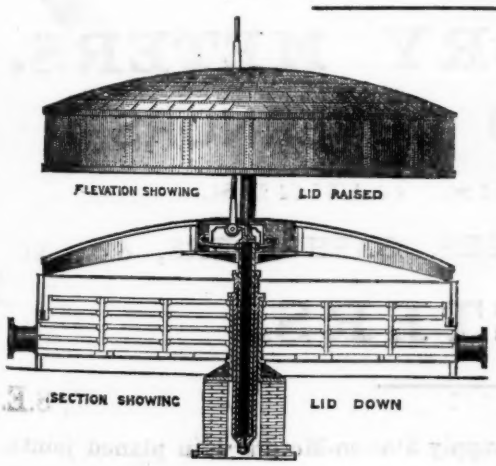
The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.	The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
,, ,, a 36 in. at Goswell Road Station.	The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
,, ,, a 24 in. at ,, ,,	,, ,, an 8 in. at ,, ,,
,, ,, a 24 in. at the Gas-Works, Beckton.	,, ,, a 24 in. at ,, ,,

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.



PATENT SELF-CONTAINED

DIRECT HYDRAULIC LIFT

FOR PURIFIER LIDS

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 24, 1874.

Circular to Gas Companies.

THE Commissioners for the revision of the price of gas, in the case of the Imperial Company, commenced their sitting in Committee Room A of the House of Lords last week, and when they rose, on Saturday afternoon, had heard the whole of the case in support of their application. The sittings will be resumed on Thursday next, when the case of the Metropolitan Board, in opposition, will be heard. We give to-day a full report of the proceedings, as far as space will admit, and a summary up to the latest time—the full report to be continued in future numbers of our JOURNAL. It will be seen that the company have applied for the addition of 1s. 1d. per 1000 to the present price, 3s. 9d. The whole of this, it is admitted, is not required to enable the company to pay their maximum dividends for the current year. In the first half of 1873 a draft had to be made on the company's reserve-fund, to make up a deficiency of profit to pay the dividends; and in the second half year a much larger draw has been necessitated. In the view of the directors, the following clause, in the Company's Act of 1869, entitles them to claim such a price as will not only yield the maximum dividends, but also make up, within the year, the reserve-fund to the full amount.

In fixing the price for any year, the commissioners shall observe the following rules:—

(1) They shall fix such a price as shall be calculated to yield to the company, with due care and management, a dividend in that year (after allowing for the excess or surplus, if any, carried in the then last preceding year to the credit of the divisible profit, and to the reserve-fund of the company) attaining as near as may be, but in no case exceeding, the rates of dividend to which the respective capitals of the company are entitled under this Act, and to make up the reserve and contingency fund of the company.

Now, as to the legal aspect of the matter, we can offer no opinion, the case being *sub judice*, but as to the impolicy of the demand we think there can hardly be two opinions outside the company's board-room. It is enough to-day to secure a full dividend; a reserve-fund might wait for happier times. We may say, however, that Mr. Parkes, the Board of Trade auditor, considers that the strict words of the clause we have quoted compel the commissioners to fix a price which will enable the company to make up the reserve-fund within the year.

The report to be presented at the next half-yearly meeting of the Imperial Company has been issued, and we learn by it that the amount to be drawn from the reserve for dividend is £41,646 14s. 9d., which will leave a balance to the credit of the fund of £27,066 6s. The enhanced price of coal has entailed on the company an additional cost for the half year of not less than £54,000, and the price they have been able to obtain for coke has been by no means commensurate with the large additional cost of coal. Every metropolitan gas company will have, we expect, to make the same statement, both for the past and the current half year. The directors remark especially on the increased cost of purification, on account of the order of the gas referees with respect to sulphur, and certainly the increase does look enormous, the cost of the past half year having been just three times that incurred in the corresponding half of 1872.

A provisional agreement has been entered into by the directors of the Wigan Gas Company and the Local Board for the sale and purchase of the gas undertaking, the consideration agreed upon being 22½ years purchase of the company's income, £5781 5s. 8d. A special general meeting of the shareholders has been called for March 2 next, to ask their sanction to the sale, which we do not suppose will be withheld. The sections of the Wigan Improvement Bill which relate to gas matters are strongly protested against by the townships included in the gas limits, and especially one clause, which will authorize the Corporation to charge 1s. 3d. per 1000 more than the company were empowered to charge.

At a meeting of the Local Board of Tunbridge Wells, a resolution was carried, to the effect that it is desirable to acquire the undertaking of the gas company. The purchase is, however, opposed by many in the town, who are well content that things should remain as they are. Some sensible people see clearly enough that they are not likely to be better served by the Local Board than by the gas company, and they very reasonably object that gas profits should go to needy water-works, or in aid of unprofitable sewage farm operations. They make a mistake, however, in supposing that Parliament would not sanction such an appropriation of surplus profits, and if the negotiations should be proceeded with, it will need all the vigilance the gas consuming ratepayers can exercise, in order to secure that the surplus profits shall be devoted to the only legitimate purpose — a reduction of the price of gas. So far we have learned nothing respecting the terms of purchase proposed, but in this case, as in the one mentioned above, the directors will be perfectly justified in standing out for the full price of 25 years purchase. There may be circumstances connected with the Wigan undertaking which justify the directors in accepting a lower consideration, but these certainly do not obtain at Tunbridge Wells.

The disastrous explosion and fire at Halifax have had the consequence we anticipated—the Messrs. Lister, whose mill was destroyed, have brought an action against the Corporation to recover £65,000, the estimated amount of the damage and loss. The insurance companies, eleven in number, whose liabilities, it is said, amount to £36,000, have moved the Master of the Rolls for an injunction to restrain Mr. Lister from making a compromise with the Corporation, which, it is alleged, he has expressed his willingness to do for £23,000. This, the insurance companies contend, is sacrificing their rights to recover from the Corporation the amount paid to Mr. Lister. The insurances are said to amount to £23,000 less than the damage sustained, and to take this sum from the Corporation, and leave the insurance companies to the glorious uncertainty of the law, does certainly look like an odd course to pursue. The injunction was granted on conditions.

The Liverpool United Gaslight Company have found it necessary to make a further advance in the price of gas, which will now be 4s. 3d. in the town, and 4s. 6d. in the out-districts. The company are unable to pay full dividends for the past half year on the whole capital; but it is hoped that the increased price will put them in a better position for the current half year. As, however, the company are largely dependent on cannel coal, it is not likely than any considerable reduction in their expenses will take place. At the recent half-yearly meeting, it was resolved to convert the £25 shares into stock.

The Air Gas Company have not got out of Chancery. An attempt was made to have the petitions for the winding up of the company dismissed, but the Vice-Chancellor decided that they

should stand over until the report of the committee, appointed to investigate the affairs of the company, is presented. The decision is fair. It is in every respect desirable that the affairs of the company shall undergo a thorough investigation, not only from a commercial point of view, but by scientific men competent to express an opinion on the value of the so-called invention, for which so much money has been paid. The knowledge gained by such an inquiry, if it be properly conducted, will be of the utmost value when the public are invited to find money for any similar scheme. We believe that the carburation of air for illuminating purposes (at all events, on a large scale) is a delusion; but we are ready to be convinced of the contrary by competent authority.

When the steam stoker was brought forward, we hailed it with delight, as a blessing both to gas companies and their *employés*. To the latter it promised relief from exhausting labour, to the former it seemed to offer a regular service, which would be undisturbed by the influences that make manual labour uncertain. We have to-day the gratification of publishing a communication, from an able and esteemed correspondent, descriptive of an invention which promises to convert steam stokers into old iron. We have already mentioned Mr. Foulis's hydraulic stoker, and had hopes that before now we should have been able to give our readers a full and illustrated description of the invention. This is unfortunately delayed; but, in the meantime, we furnish the account forwarded by our correspondent. The merits of Mr. Foulis's invention are its simplicity, its lightness, and, we might say, its docility. Its advantages over the steam stoker in all these respects are very great; and it may be supposed that to these will be added the advantage of comparative cheapness. We have, however, at present, no estimate of the cost of the machines, but there can be no doubt that it will be much less than that of a steam apparatus. On another point we are as yet without information, and that is the expenditure of water—a matter of consequence in some works. It is to be hoped that the machine will soon receive a trial at one of our metropolitan works.

Swansea is in a state of chronic disaffection towards the gas company, but it is not easy to say why. Loud complaints are made that the company do not fulfil their obligations; but, surely, if there be any foundation for them, the remedy is in the hands of the local authority. Gas companies are not above all law. We notice that a member of the local authority has recently been appointed chairman to the gas company, and, possibly, this may bring some peace. There is, as usual, a talk of establishing a competing company. If such a thing should be seriously contemplated, we may recommend the projectors to take note of what has happened at Aberdare. The experience gained in that town will not encourage them in setting up a "limited," to compete with a statutory company.

If the stories that reach us be only half true, there is greater occasion than ever for a committee of shareholders of the Dublin and Alliance Gas Company to zealously watch over their interests. We have nothing to say against the present Board of Directors, but we consider them bound to announce a distinct policy. If they have resolved to dispose of the undertaking, they ought not to engage in any sham contest with the Corporation. They owe that as a duty to their fellow-citizens, no less than to the shareholders. The Corporation of Dublin have no money to throw away on expensive parliamentary proceedings, and we know that the company have plenty of other ways of profitably disposing of their funds. The Corporation are impecunious in the last degree. "Dublin," says a native, "cannot find money to pay for the sweeping up and carting "away of the mud from its thoroughfares—cannot afford to give "two of the disused basins to be used as public baths, or to have "frec public reading-rooms and lending libraries for the use of the "humble class of citizens; is without proper sanitary arrange- "ments, wants a public convalescent establishment, an hospital "ambulance, and an efficient system of domestic scavenging— "yet must find money to pay increased salaries to already over- "paid officials, to pay useless treasurers, to pay for the . . . "reports of eminent gas engineers, and large sums on bungling "amateur gas legislation." And we will add that if the shareholders of the gas company are not on the alert, they may find themselves, in vulgar parlance, "sold," along with their undertaking.

WATER AND SANITARY NOTES.

The resignation of Dr. Letheby of the post of Medical Officer of Health to the City of London, which he has filled for now exactly 20 years, could hardly be passed over without some notice on our part. The City of London loses an officer whom they will find it extremely difficult to replace. Medical men are but too plentiful; but medical men, combining the qualifications, intellectual and moral, which fit them for the appointment of officer of health to an important city, are, we are bold to say—scarce. The City of London has hitherto been remarkably fortunate in their appointments. The first officer under the Act of 1848 was Mr. Simon, an accomplished surgeon and physiologist, whose reports —models of composition and of elegant diction—soon attracted attention, and led to his speedy promotion to the post of medical officer to the Privy Council. He was succeeded, in 1854, by Dr. Letheby, whose practical sagacity and wide general knowledge of everything that appertained to, or was in any way concerned with, the duties of a medical officer of health, carried on the work of sanitary reform, until the City of London has become as healthy as some of our best situated rural districts. We must not be misunderstood here. The condition of things has greatly changed in the City since 1848. The City has become largely depopulated as regards the sleeping population, who figure alone in the mortality returns. But the circumstances that have contributed to bring about this depopulation have also brought about a *squeezing in* of the poorer classes, which has necessitated a greater vigilance on the part of the sanitary officer. At the present time it may be said that the sanitary reform of the City is accomplished; and all that is now required is vigilant inspection to make sure that the general healthiness, now established, is maintained. But more than that is involved, when the appointment of a health officer to the first city in the empire is considered. It may be said, without exaggeration, that the medical adviser of the City of London, in the person of Dr. Letheby, had become the medical adviser of half the world. There is scarcely a capital in Europe which has not applied to him for information and advice, and many large cities in the Western Hemisphere as well, have sought his counsel. The appointment to the City of London has, therefore, a cosmopolitan importance, which the Commissioners of Sewers will do well to take into consideration, when they come to decide on a successor to Dr. Letheby. It seems to be commonly supposed, that any man with a medical qualification (we use the word in its legal, and not in its rational, sense) will do for the appointment. In fact, however, a medical officer of health should have varied attainments, not often to be found in one individual. He should be a man having a practical acquaintance with diseases and their treatment. He should be a physiologist, having a sound knowledge of the functions of all parts of the body, and able to appreciate the conditions under which they can be healthily exercised—in other words, he should be well acquainted with the natural laws of health. He should be a chemist, able to seize upon noxious forms of matter, and know how to render them harmless. Seeing how often an officer of health is brought into collision with manufacturers and their operations, he ought to possess a varied technical knowledge, so that he may not only condemn (which any one could do), but suggest remedial measures. And further, assisted, though he always is, in his duties, by an engineer or surveyor, and a lawyer, it is none the less necessary that a medical officer of health should have some knowledge of engineering and of law. It often rests with him to say the last word as regards the adoption of expensive sanitary works; and, in his ordinary routine, he is more or less concerned with the administration of between 70 and 80 Acts of Parliament, with all of which he must have some acquaintance. Lastly, we must put the possession of moral courage as an essential qualification for a medical officer of health. A man's worst foes are those of his own household, and the greatest offenders against sanitary laws are to be found among members of Local Boards; so that it often requires great courage to stand up against the covert influence and the loud-voiced antagonism of these characters. It is very easy to be a popular, not so easy to be an effective, officer of health. It will be seen that the considerations we put before our readers are general, and not all specially applicable to the City of London. All we wish to impress on the Commissioners of Sewers is, that the appointment they have in their gift is, in its general influence, the most important of the kind in the kingdom, and the whole country will look to them to select the best man who can be found.

A decision arrived at by the judge of the Clerkenwell County Court, in a suit instituted by the New River Company, is of considerable importance to water companies. The company sued for a rental on the "annual value" of the premises, as set down in the valuation list, which was £22. The defendant contended that annual value meant the value after all deductions were made, which, in his case, brought the annual value to £18. In the end the judge came to what we must regard as the extraordinary decision—that the rent which a tenant paid to a landlord is the annual value of premises. The decision is, of course, appealed against, and the result cannot be doubtful. To take the single case of a tenant paying a heavy fine for the renewal of a lease, and paying, in consequence, a relatively small rent—Is the rent paid to the landlord to be considered the annual value of the house? It may be that the better course would have been to have the annual value of the tenement settled by two justices, as prescribed by the Water-Works Clauses Act, 1847; but it will be

well to have the meaning of the words, "annual value," settled by a superior court.

The Liverpool Corporation, we are very sorry to see, have been defeated at the public meeting called under the provisions of the Municipal Corporations (Borough Funds) Act; and it has been decided to take a poll of the borough. As the first example of the kind, the result will have great interest, and especially in such an important place as Liverpool. We are glad to find those provisions of the Act, for which we most strongly contended when it was under discussion, thoroughly appreciated in Liverpool, and would warn the ratepayers against the advice tendered to the Corporation, to go to Parliament for the repeal of the measure. But, in the matter under discussion, we cannot help feeling that the ratepayers are in the wrong. It may have been a mistake for the Corporation to undertake a supply of water to the out-townships, but the supply has been undertaken, and now cannot be avoided. As we have said before, the defeat of the Corporation now, can only end in putting the ratepayers to greater expense than would be incurred if the Water Bill became law, and for this reason we still hope they will consent to the promotion of the Bill.

The profits of the Brighton Corporation Water-Works are certainly not large, but they may be considered satisfactory, if the inhabitants are contented with the supply. It seems that the Corporation have made £603 profit in the course of the two past years, which they have carried to a contingency-fund—a fund which is likely to have demands made on it.

The Municipality of Berlin have determined on taking the water supply into their own hands, and buying up the water company before the concession expires. The consideration to be paid is, perhaps, fair, but not liberal; and the company will now be wound up, leaving the mark of English enterprise in the principal city of Germany.

We have received a polite note from the borough surveyor of Rochdale, in answer to some remarks made in a review of the Rochdale plan of dealing with town refuse, published in our last. On one point—the plan adopted with regard to disused cesspools—the note does not furnish us with the information we asked for; and on the second—the addition of sulphuric acid to the compost—we must still contend that the better plan would be to add the acid to the excreta before any ashes are mixed. In that way the evolution of free ammonia would be avoided. We do not understand how the addition of sulphuric acid promotes the evaporation of water. It may cause the absorption of some, by the formation of plaster of Paris, when sulphuric acid is added to the ashes.

PROVISIONAL ORDERS (GAS) FOR 1874.

The *Braintree and Bocking Gas Order* is to empower the Braintree and Bocking Gas Company to manufacture and supply gas to the parishes of Braintree, Bocking, and Black Notley, Essex. The nominal original capital is £12,000, of which £10,500 has been raised; this order authorizes new capital to the amount of £8000, the dividends on which are limited to 7 or 6 per cent., according as the shares are ordinary or preference. The gas supplied is to have the illuminating power of 14 candles, and be in all respects in accordance with the provisions of the Gas-Works Clauses Act, 1871. The price of gas is not to exceed 6s. 5d. per 1000. This and all the other orders make it incumbent on the company to establish, within six or twelve months, testing apparatus according to the Gas-Works Clauses Act, 1871, and in all cases prescribes the use of Sugg's London Argand, No. 1, with a chimney according to circumstances. It is also in all cases provided that money on deposit shall be entitled to interest at the rate of 5 per cent.

The *Brough Elloughton, and District Gas Order* is to authorize the Brough Elloughton, and Wilton Gaslight Company to maintain works and supply gas to several townships in the county of York. The share capital is not to exceed £6000. Gas of 12-candle illuminating power is supplied, and the price is not to exceed 9s. per 1000. Section 8 of the order provides that all tanks for the reception of residual products and foul lime shall be properly covered over.

The *Chelmsford Gas Order* will empower the Chelmsford Gaslight and Coke Company to supply the parish of Chelmsford and some adjoining parishes in Essex. The original capital of the company is £22,325, of which £20,860 has been raised. The order authorizes £10,000 additional capital, the dividends on which are limited as usual. The gas is to have the illuminating power of 14 candles, and the price is not to exceed 5s. 10d. per 1000 feet.

The *Dartford Gas Order* is simply to authorize the Dartford Gas Company to construct and maintain additioual works, and apply for this purpose capital or funds now belonging to them, or which may be raised under the powers of the Dartford Gas Act, 1867.

The *Guildford Gas Order* is to extend the limits of the Guildford Gaslight and Coke Company, so as to include some surrounding parishes and to raise additional capital to the amount of £30,000 by the issue of new shares (to be called F shares), either ordinary or preference. Borrowing powers to the usual extent, and under the usual conditions, will be granted, if the order be confirmed. The dividends on the new capital are limited as usual. Gas of 12-candle power is to be supplied, and the price is not to exceed 7s. 4d. per 1000 feet within the extended limits. In this particular instance the testing-place, meter, and apparatus are to be in accordance with the company's Act of 1857.

The *Harwich Gas Order* will authorize the Harwich Gas and Coke Company to supply gas to Harwich, Dovercourt, and Ramsey. The original capital of the company is £12,000, and this order will give power to raise an additional £12,000, the dividends on which are restricted to the now usual rates. Power will be given to purchase, by agreement, some additional land on which to erect works. The gas supplied is to have the illuminating power of 14 candles, and the price is not to exceed 7s. 1d. per 1000 feet.

In our last we noticed the *Lofthouse and Liverton Gas Bill*, which is intended to incorporate a company with powers for the supply of gas to a mining district in Yorkshire. There are also two applications for Provisional Orders for power to supply the same district. The *Lofthouse and Liverton Gas Order* is to empower the undertaker, Mr. John Dunning, of Middlesborough, to construct and maintain works for the purpose. The *Lofthouse and District Gas Supply Order* is to authorize the Lofthouse and District Gas Company, Limited, to supply gas to a district a little more extensive, and employ a capital not exceeding £12,000 in the business. What the several schemes offer will be seen below:—

	Quality of Gas.	Max. Price.
Lofthouse and Liverton Gas Bill	12 candles.	7s. 6d.
,, ,, Gas Order	12 ,,	7s. 6d.
,, and District Gas Supply Order . .	14 ,,	7s. 0d.

The *Retford Gas Order* is to empower the Retford Gas and Coke Company to supply gas to Retford and the surrounding neighbourhood. No capital is asked for. The gas is to have the illuminating power of 14 candles, and the price is not to exceed 6s. per 1000 feet.

The *Romford Gas Order* will confirm the Romford Gas and Coke Company in their limits, and authorize them to raise further capital. The original capital is £14,000, and the additional is limited to £6000, the dividends on which are restricted as usual. Gas supplied is to have the illuminating power of 14 candles, and the price is not to exceed 6s. 6d. per 1000 feet within a mile of the works, or 7s. 6d. beyond.

The *Sidmouth Gas Order* will confirm the undertaker, Mr. John Dunning, of Middlesborough, in a right to manufacture gas for the supply of the parishes of Sidmouth, Salcombe Regis, and Sidbury, in the county of Devon. Gas of 14-candle power is to be supplied, and the price is not to exceed 8s. 4d. per 1000 feet.

The *Sutton-in-Ashfield Gas Order* will fix the district of the Sutton-in-Ashfield Gaslight and Coke Company, and limit their capital to £20,000. It will also give them power to issue debenture stock. The gas supplied is to have the illuminating power of 14 candles, and the price is not to exceed 6s. 6d. per 1000 within a mile of the works, or 7s. 6d. beyond.

It may be remarked here that all the above orders incorporate the Gas-Works Clauses Act, 1871, and prescribe the day and night pressure at which gas is to be supplied. There is also in every one the saving clause, that no penalty shall be incurred for deficiency of pressure, defect of illuminating power, or excess of impurity, if it be proved that such defect or excess was occasioned by unavoidable cause or accident.

THE FIRST REDUCTIONS.—The two gas companies at Woolwich—the Equitable and Consumers—which raised the price of gas some time since from 4s. 6d. to 4s. 9d. per 1000 feet, consequent on the rise in coals and labour, have now announced, simultaneously and unsolicited, that their charge will be reduced to 4s. 6d. again, dating retrospectively from the 1st of January.

THE INSTITUTION OF CIVIL ENGINEERS.—We are asked to state that supplemental meetings for the reading and discussion of papers by students of the institution have been appointed for the following Friday evenings:—Feb. 27, March 6, 13, 20, and 27. The papers to be read on these evenings are respectively, "On Coal Gas," by Mr. G. E. Page; "The Lisbon Steam Tramway," by Mr. M. Curry, jun.; "The Sewage and Drainage of Towns," by Mr. W. H. Cobley; "The Construction of Tanks," by Mr. J. C. Inglis; and "On Setting out a Line of Railway," by Mr. J. C. Fergusson. The chair will be taken at seven o'clock on each evening, and successively by Dr. Pole, F.R.S.; Mr. Bruce, Mr. Bazalgette, C.B.; Mr. Bateman, F.R.S.; and Mr. W. H. Barlow, F.R.S.

BUENOS AYRES GAS COMPANY.—We learn from a correspondent that the old gas company of Buenos Ayres have on hand a sum of 3 millions m/c, and that the municipality are indebted to them in the sum of 6 millions m/c. This gives a total of 14 millions, which is intended to be applied in payment of dividends at the rate of 18 per cent. per annum for two years, from the 1st of July next. The payment of these dividends will absorb 5,580,000 m/c, and the remainder will be devoted to cover any losses which may arise in competing with the new Mutual Company to whom, as we understand, the public lighting has been entrusted by the municipality.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

II.

Historical Introduction.

(*Continued.*)

Contemporaries with Dr. Watson were the renowned chemists, Black, Priestley, Cavendish, Scheele, Lavoisier, and others, who devoted themselves to the development of the science they did so much honour to, and whose labours were productive of the most remarkable results.

The first in the order of time of these great men was Dr. Black, who produced carbonic acid gas, and on investigation found its nature and qualities to be directly the opposite of those of atmospheric air; this being the first recorded instance in which the gas was obtained in an unmixed state, and the positive knowledge of its dissimilarity to our atmosphere acquired. To this gas, the term "fixed air" was given, signifying air that had been fixed in the body from which it was derived; and this term was subsequently applied by chemists, for several years, to all gases, repeating the ideas of Van Helmont.

Dr. Priestley, in addition to his other wondrous researches, which have contributed so largely to the advancement of science, discovered, in 1774, the gas, oxygen, and by one of those inexplicably fortuitous circumstances, in which two persons, in absolute ignorance of the pursuits of each other, and personally unknown the one to the other, study the same subject, and arrive at the same important result—Scheele, at the same period, and, under identical circumstances, discovered oxygen gas simultaneously with Priestley.

To Dr. Priestley the art of gas lighting is also particularly indebted for the most important part of its mechanical appliances, the "water-lute"—an indispensable contrivance, used in nearly all the apparatus of a gas-work, and for which, in some cases, no possible substitute could be found. Although something had been done in pneumatic chemistry by Boyle, Hales, and others, the results they obtained were far from being serviceable to the purpose in question; but by Dr. Priestley's invention of the pneumatic trough, its sliding trays, inverted jars, and similar means, the great mechanical auxiliaries were obtained; and we are now led to reflect how gas lighting could have been effectually accomplished without them. Deprived of these, the simplest and most effective of all mechanical resources, it would not have been possible to construct gasholders of their present magnitude, or, admitting that they might be constructed, their cost would be fabulous and their duration transitory, as compared with the present system. Without this invention, what substitute for the water-lute of purifiers could have been applied? or what provision could have been made for the simple water-luted pipe for preventing undue pressure, as indispensable to a gas-work as the safety-valve to the steam-boiler? It is well, therefore, that this one great essential to the art was invented, before the thought of the application of lighting by gas entered the mind of man.

Cavendish, at the same epoch, instituted investigations into the inflammable air (hydrogen) of Hales and others, and found it to be the lightest of all matter; that it was evolved in different quantities according to the metal acted upon by the acids and water; and he observed also its other various characteristics. After some years of labour and experiments, he, in 1784, made the astonishing discovery that this gas was one of the components of water.

During this period extraordinary discoveries were made by the great chemists named. By them the compositions of our atmosphere and water were determined, the cause of combustion, with its resulting gases, was made known; and innumerable other marvellous scientific facts, foreign to our subject, were ascertained.

The discovery made by Cavendish induced Lavoisier and Meusnier to determine the composition of water by analysis. For this purpose they passed steam through a red-hot pipe, whereby they obtained a quantity of inflammable air, which, when mixed with atmospheric air or oxygen, exploded on being ignited. They further determined, from the similarity of the gas so obtained to hydrogen, that this gas only was produced, and the oxygen deposed. Reasoning from analogy, that carbon possesses a considerable affinity for oxygen, they afterwards introduced charcoal into the pipe, which resulted in a considerable increase of the quantity of gas, although of a somewhat different and mixed nature.

Here was the first production of "water gas," which has since occupied the attention of many active and intelligent minds, and led to the employment of considerable capital, with the view of rendering it available for lighting, although hitherto without any definite success.

Reference to our patent register shows that endeavours were speedily employed to turn to advantage the explosive qualities of compound gases, in order to procure motive power. The earliest of these schemes was patented by John Barber (1791) for "a method of using inflammable air for the purposes of procuring motion." A part of his specification, as bearing on the setting of retorts, is here given: "This apparatus consists of a metallic vessel called a retort, so contrived that, when heated by a circumambient fire, coal, wood, oil, or any other combustible matter, may be put therein, and the smoke or vapour collected." Four years after, a similar patent was obtained by Mead, in which he describes the action of the explosive compound on a piston, in order to procure motion. Again, the following year (1797), Street patented the means of obtaining explosive compound by the "vapours of spirits of tar," combining with atmospheric air. It may be also stated that in 1781 Lord Dundonald procured a patent for "extracting or making pitch, tar, essential oils, volatile alkali, mineral acids, salts, and cinders from pit coal;" thus embracing all the products of coal except the most valuable—gas.

In 1786 the celebrated Lavoisier and other French chemists, in opposition to the opinion of their friends and collaborators, Priestley and Cavendish, decided on adopting a general expressive chemical nomenclature, and by them the word gas was revived and selected to apply to all permanent aëriform bodies. Hence its adoption into every civilized language either as *gas* or *gaz*.

But, with all these marvellous achievements, the art of gas lighting was not materially advanced, as will be well understood from the following extracts from Dr. Priestley's "Experiments and Observations on Different Kinds of Air," published 1790. The author, when treating on inflammable air, so far as relates to our subject, remarks:—"There are different kinds of inflammable air, as has been observed by most persons who have made experiments on air. That which has been commonly observed is, that some of them burn with what may be called a 'lambent flame,' sometimes blue, sometimes yellow, and sometimes white, like the flame from wood or coal in a common fire; whereas another kind always burns with an explosion, making more or less of a report when a lighted candle is dipped into a jar filled with it. Of the latter kind is that which is extracted from metals by means of acids, &c., and of the former kind is that which is expelled from wood, coal, and other substances by heat. It is observable that when wood is heated in an earthen retort the first portion" (of inflammable air) "burns with a lambent white flame, like that from burning wood in an open fire." Hence it appears that at this period there did not exist the most vague idea of the use of inflammable air as a means of artificial light.

In our brief narrative we have now described the first ideas respecting gases, the primitive bases of pneumatic chemistry, the earliest productions of inflammable air, the spontaneous emissions of carburetted hydrogen from the earth and its ignition, the manufacture of the same gas, together with the means of storing it, and, on a small scale, its application to lighting. All this had been achieved, but there was still wanting the mind to conceive the mode of applying coal gas to useful purposes, and the intelligence to carry it to a successful issue.

We now pass from the visionary to the reality, and from the speculative to the positive.

History of Gas Lighting.

The honour and merit of the first application of coal gas to useful purposes is, beyond all question or doubt, due to Mr. William Murdoch, who, in the year 1792, then residing at Redruth, in Cornwall, directed his attention to the quantities and qualities of different kinds of gases obtained by distilling various mineral and vegetable substances; and who from observations he had made on the burning of coal, was induced to try the combustible properties of gas derived from that as well as peat, wood, and other inflammable substances. Being struck with the great quantities of gas they afforded, as well as the brilliancy of its light and the facility of its production, he instituted several experiments, with the view of ascertaining the cost of light obtained from gas, compared with that yielded by oils and tallow.

His apparatus consisted of an iron retort with tinned iron and copper tubes, through which the gas was conducted to a considerable distance, and at the end, as well as at irregular points, the gas was burned through apertures of various forms and dimensions. The experiments were made on various descriptions of coal, for the purpose of obtaining the best results; the gas being washed with water, and other means being adopted to purify it.

From that period, at various times, he renewed his experiments, and in 1798, being engaged at Messrs. Boulton and Watts's works for the manufacture of steam-engines, at the Soho Foundry, Birmingham, he erected an apparatus upon a larger scale, by which a principal building was lighted with gas during many successive nights, and various new methods of washing and purifying the gas were practised.

These experiments were continued from time to time until the peace of 1802 (the spring), when a public display of gas lighting was made in the illumination of Messrs. Boulton and Watts's manufactory. One of the earliest writers on gas lighting (Matthews), when describing this event, says: "The illumination of Soho Works on this occasion was one of extraordinary splendour. The whole front of that extensive range of buildings was ornamented with a great variety of devices, that admirably displayed many of the varied forms of which gaslight is susceptible. This luminous spectacle was as novel as it was astonishing; and Birmingham poured forth its numerous population to gaze at, and to admire this wonderful display of the combined effects of science and art. The writer was one among those who had the gratification of witnessing this first splendid public exhibition of gas illumination, and retains a vivid recollection of the admiration it produced." From that time the apparatus was extended so as to light all the principal shops in the establishment with gas, where it was in regular use, to the exclusion of all other artificial light.

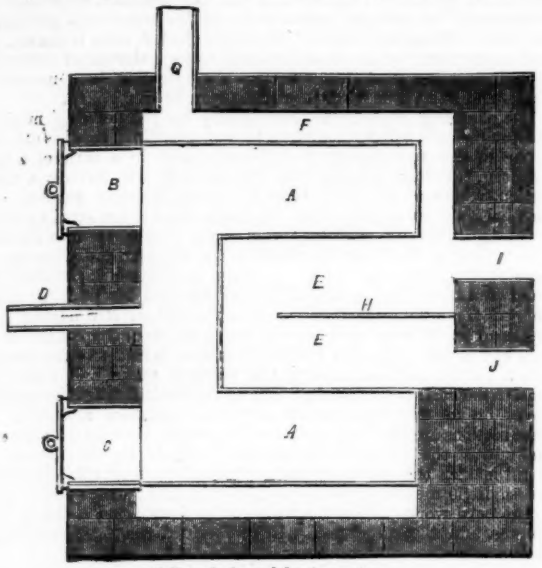
By the foregoing narrative, described almost in Mr. Murdoch's words, we are informed of the first practical manufacture and application of gas for lighting. The statement was confirmed by Dr. W. Henry, of Manchester, and various others; also in part by the evidence of Mr. James Watt, jun., hereafter mentioned, so as to leave no possible doubt about its accuracy.

Several French authors, ignoring the claims of Murdoch, have accorded the merit of priority in the application of coal gas for domestic purposes to their compatriot Philipe Lebon (generally, but erroneously, written Le Bon), who, according to some, in the year 1786, and others 1798, "patented his thermolampe, a kind of stove or oven, in which he distilled wood or coal, in order to obtain the

necessary heat for warming dwellings or workshops, and at same time the gas for lighting them."

The error in these statements will be made apparent by perusing the specification of Lebon's patent of 1799 (prior to this year he had no patent), of which the following is a literal translation:—

"For a New Method of Employing Fuel (combustible) with greater Utility either for Heating or Lighting, and to obtain certain Products therefrom.



"Description of the Apparatus.

"Fig. 1 is a section of the apparatus.

"A A is a box (*caisse*) having two ends of pipe, B and C, hermetically closed, into, and from which the fuel may be introduced and withdrawn.

"D is a third pipe for the purpose of conveying the vapours or gas which are emitted from the fuel enclosed in box, A A.

"E is a furnace placed in the box, A.

"F is a chimney or division from the furnace, in communication with the pipe, G.

"H a division which separates the furnace into two parts, leaving a passage for the air.

"By means of the pipe, D, the gases and vapours can be conveyed and distributed, or compelled to pass any number of condensers or baths that may be thought convenient, and submitted to all the known means of purification and analysis, and to collect the various products;—in a word, this pipe allows the gas to be disposed of at will.

"Hydrogen gas in a more or less state of purity, according to the means of purification employed, is principally obtained.

"The vapours, on being exposed to cold condensers, are reduced to a liquid state, and contain acids, oils, and other substances analogous to the fuel placed in the box, A. This is converted into coke (*charbon*), and can be employed in the furnace to heat or decompose new fuel and produce the same effect.

"The opening, I, which can be closed at pleasure, is for the purpose of introducing the coal (*charbon*) on the division, H, and opening, J, placed in the lower part of furnace, allows a passage for air to support the combustion.

"All being thus disposed, and the box, A, containing the fuel to be decomposed, and the coal of the furnace ignited, the action of the heat causes a considerable quantity of vapours and gas to be discharged."

A memorandum attached to the specification states that "either wood, coal, oils, roots, grease, and other combustible matters can be employed, the results being always the same."

A few words in explanation of this specification may be necessary. The box, A A, probably intended to be constructed of sheet iron, was the retort; B and C, the mouthpieces; D, a pipe answering the purpose of the modern ascension-pipe; E the furnace, with H, a plate instead of fire-bars; F, a flue to chimney, G; I, furnace door; J, orifice for air, which was intended to pass over the top of the fuel on the plate, H, so as to support combustion. It need hardly be observed that the apparatus is of the most impracticable kind, but we must remember this was the first crude idea.

By this specification we are led to the conclusion that Lebon had no definite idea or system with reference to the application of gas, either for lighting or heating; therefore the error in awarding him the merit of priority on account of this patent is clearly shown.

(To be continued.)

BRIGHTON GAS SUPPLY.—A local paper states that the dispute with reference to the amount of money due by the corporation to the Hove Gas Company in respect of gas supplied has now been satisfactorily settled. The Gas Committee of the Town Council record on their minutes, the receipt of a letter from Mr. Somers Clarke, offering, on behalf of the gas company, to halve the amount in dispute between the company and the corporation. The committee thereupon resolved that the offer be accepted, and that the Finance Committee be requested to recommend the payment to the Hove Gas Company of the sum of £11 18s. 3d., in addition to the amount already ordered to be paid to the company. Mr. E. Moore, the corporation gas analyst, has made his usual report to the Gas Committee of the Town Council, on the illuminating power and purity of the gas during the month of January. As regards the gas supplied by the Brighton (Old) Gas Company, the average of nine observations gave a value equal to 14·77 in standard candles; the highest value was 15 standard candles; the lowest value was 14·54 standard candles. The gas was always free from sulphuretted hydrogen; other sulphur impurities existed in the proportion of 11 grains in 100 cubic feet of gas. With reference to the gas of the Brighton and Hove Gas Company, the average of nine observations gave a value equal to 14·61 in standard candles; the highest value was 14·86 standard candles; the lowest value was 14·39 standard candles. The gas was always free from sulphuretted hydrogen, other sulphur impurities existed in the proportion of 9 grains in 100 cubic feet of gas. Under the head of "remarks," the analyst says the gas from both companies has in every instance exceeded the standard during the observations of the month; impurities (sulphurous) small.

Communicated Article.

LEAKAGE.

By T. H. METHVEN, Bury St. Edmund's.

In the last articles upon this subject, the great need for attention to it was pointed out, and it was shown how leakage could be reduced.

The writer distinctly stated that it was a very expensive as well as troublesome operation, and gave the results of a recent attempt that he had made.

Lest the results should have been forgotten, or the numbers of this JOURNAL in which they were contained not be at hand,* it may not be amiss to recapitulate them.

Five miles and a half of mains, varying from 8 inches to 2 inches, were examined and repaired, the work occupying eight weeks, and costing about £50 per mile. The result of the testing of the mains was that the whole leakage amounted to 450 feet per hour before repair, and was reduced to 85 feet per hour after repair, the pressure in both cases being 23-10ths.

Now, one naturally wishes to know whether the result of the next quarter's working corresponded to that of the testing of the mains in separate lengths.

Had this been the case, by making allowance for the reduction of leakage in consequence of the day pressure, the leakage would have been about 50 feet per hour, or about 100,000 per quarter.

This was not expected, as leakages from public lamps, main-cocks, and also the slow registration of old dry meters were to be considered.

The particulars of the quarter's working in 1872, and of that corresponding to it in 1873, are as follows:—

Coals Carbonized, 439 *Tons*.

	Feet.	Feet.
Gas made		4,136,000
„ sold	3,093,000	
„ used on works	90,000	
		3,183,000
Leakage		953,000

	Feet.
Gas made per ton	9400
„ sold and used	7250
„ lost	2150

Coals Carbonized, 392 *Tons*.

	Feet.	Feet.
Gas made		3,606,000
„ sold	3,200,000	
„ used on works	90,000	
		3,290,000
Leakage		316,000

Gas made per ton	9200
„ sold and used	8400
„ lost	800

The results:—Saving in leakage, 637,000 feet, worth, at 6s. per 1000 feet, £191. As, however, only part of the gas was in this case sold (107,000 feet, worth £32), this and 47 tons of coals are the actual saving on the quarter's working.

Some one might well say that these mains were badly laid at first, and everything was in favour of the work. Quite true; but it must not be forgotten that before the repairs 7250 feet per ton were sold, whilst 6600 feet per ton has found apologists where one would least have expected them. There are many gas-works, which have come within our knowledge, in which the sales per ton have not reached 7000 feet, and whose management have either not cared or not known about the state of affairs.

If the high price of coal, or want of a dividend, do not work a revolution in this department, it will be a matter of surprise to all who have studied it.

But the theoretical leakage was 100,000 feet, the actual leakage 316,000 feet. Where have the 216,000 feet of gas gone? There are 750 main and lamp cocks in the district, 600 meters, a large part of which are dry and have been badly used, and lastly an old gasholder, which may be debited with the loss, without indulging in theories about "exosmose and endosmose," "condensation," "difference in temperature."

It may be as well to state that the sales of gas per mile of main per annum were 1½ million of feet, and that the consumption of the public lamps is ascertained by average meter indication.

The above results are not given as anything remarkable, but only to complete the former paper, and perhaps to draw out the experience of some gas managers in the country, who, with an equally small consumption per mile, are selling 9000 feet per ton. If these do not put their experience in print, it may keep before gas companies a subject which has hitherto not received the attention it demands, and which it will most certainly repay.

FOULIS'S HYDRAULIC STOKERS.

The relation of capital to labour has undergone such an extraordinary change within these last few years, and the law of supply and demand, as explained by political economists, has been so completely set aside, that more strenuous efforts must be made to meet the altered order of things, by supplementing or superseding m[illegible]nual

* See JOURNAL OF GAS LIGHTING, Nos. 548 and 549.

labour by every means in our power. The old-fashioned method of procedure, when work was presented to firms or individuals, was to make the most powerful exertions to overtake it, the motto being "Make hay while the sun shines," and this spirit animated both master and man. But, *nous avons changé tout cela;* the having plenty of work to do is now urged by the leaders of the workmen as a powerful reason for doing less of it, and the masters are in a manner powerless. Not only so, but the prosperity of the country, and the demand for manual labour has been so great lately, that masters have been led to outbid one another in their offers to workmen, until the latter are practically masters of the situation.

The organization of trades unions has also helped on matters, so that we are never safe to calculate how long a trade may be able to go on, without unreasonable demands being made by the workmen, which masters, even if willing, are unable to comply with, and the result is a strike, ending in loss to all parties, but generally with the workmen gaining their ends. Things are not likely to remain in this state. We have been on the crest of the wave for some time past, and the hollow is sure to come; but trade never grows old, and a temporary lull will again be followed by a time of prosperity. Yet, even although bad trade should come, and break up workmen's unions, or render them powerless, whenever the busy time reappears the broken threads will be easily taken up, and the unions reorganized and ready for action.

The outcome of all this must be the introduction of labour-saving machines in every branch of manufacture where they can be applied. That seems to be the only way in which strikes can be met, and the shortened hours of labour compensated for. Inventors who apply themselves to the production of such machines should receive the greatest encouragement from all who wish to see our country retain its high position as a manufacturing nation. But, besides, there is another and different view of the matter, which urges upon us not only the necessity, but the duty, of applying such machines, and that is where the nature of the labour is severe and exhaustive, or miserable in its monotony. The introduction of machines in such special cases is urgently required, not only to meet enlarged demands on the productive power of the country, but also on the grounds of humanity. Who that has stood before a puddling furnace and watched the puddler, in nearly a state of nudity, toiling and sweating at every pore, but must have hailed with delight the advent of Danks's rotary puddling furnace. The waste of human life in that branch of the iron manufacture must have been something terrible during the last 30 years. In another and opposite direction, we see Blake's stone-crusher chewing up whinstone and granite with the greatest ease, thus relieving men from the miserable and monotonous occupation of stone-breaking by hand. The introduction of coal-cutting machines is another instance of what may be done in this direction. It is understood that the Bairds, of Gartsherrie, have some of those machines at work, giving excellent results, and the general adoption of them will relieve the miner of the so-called misery of his occupation, which, perhaps, he reasonably enough grumbles at, but is now handsomely paid for. And last, but not least, machines for drawing and charging retorts are destined to do for gas stokers what these other machines are doing for the workmen in their respective branches.

The writer has been led to these remarks by having the opportunity of seeing the new mechanical stoker for gas-works, invented by Mr. Foulis, of Glasgow, which is being much talked of, and was noticed a short time since in these pages. Being in the vicinity lately, he took the opportunity of going out to Dawsholm, and asking permission to see the machines at work. He was not disappointed. He was taken by a young and intelligent engineer to the retort-house, where the machines are placed. Many of our readers must be familiar with the "steam stoker" at Beckton works, and have seen it in operation. Far be it from the writer to say a word against it. It is the pioneer which has cleared the way, and shown that mechanical stoking is not an impossibility. On that account the inventor deserves all praise. It is an unwieldy machine, however, and, so far as he knows, is not used except on special occasions, but stands mutely proclaiming its inability to compete successfully with manual labour. The power required for a mechanical stoker is not great. A man of ordinary strength has no difficulty in drawing and charging a retort in very little time; but when he has to continue the work the heat soon tells upon him, and it is that, more than the muscular exertion, that tires and exhausts him. The employment of such a massive piece of machinery as that at Beckton is something like harnessing an elephant to pull a Hansom cab. Having in mind the idea of that machine, and also the stoking machine fully illustrated some time since in the *Scientific American*, and later in these pages, which from the drawings seemed to be about the size of an ordinary hay-stack, the writer was prepared to see something in the same style at Dawsholm, but was agreeably disappointed and not a little surprised to see two small machines, consisting of a slender framework, supporting two or three hydraulic cylinders with pistons, to communicate the requisite motions to the different parts. He arrived considerably before the time of charging, so had ample opportunity of having the whole explained to him by his courteous guide, who seemed to have great pleasure in answering all questions put to him. When the time for charging arrived, a man took his place behind the drawing-machine, while another opened the hinged doors of the retorts, and it was really a pleasure to see the ease with which the machine was handled.

By touching alternately two levers, the apparatus can be moved horizontally the whole length of the retort-house, and parallel to the retort-bench, while by a four-way stopcock another horizontal motion is obtained at right angles to the bench, and by that motion the rake is sent forward into the retort, stopping at any part or going fully to the back as required.

The long cylinder, which contains the piston to which the rake is attached, is balanced on an axis somewhat similar to the beam of a pair of scales, so that all the motions are secured for keeping the rake at the front, middle, back, or sides of the retort, and the workman has thorough control over these motions; indeed, it seems as if there was actual sympathy between him and the machine, so prompt and delicate are the changes he can make on the action and position of the rake. By another turn of the stopcock, the coke is drawn, and at the same time by an admirable contrivance a shower of water falls upon it, cooling it and completing the operation in a manner so simple and so effectual that it must be seen to be realized.

The charging machine follows closely on the drawing machine, and the charges being wheeled up to it on a bogie, a chain is attached to one of the trough-shaped coal-boxes, and by a turn of a lever is raised, the chain passing over two slender jibs, having a radial motion, which at the same time keeps the coal-box parallel with the charging scoop, and when let down, the hinged arms by which it is suspended are slackened, and then caught by two clutches, thus releasing the hinged bottom of the coal-box and allowing the coals to drop into the scoop. A turn of another lever sends the scoop into the retort, and while it has reached its position and is stopped from going farther forward, the piston, still having some length to travel, acts upon part of the chain wound upon the round back end of the scoop; the horizontal motion is thus at once changed into a rotary motion, causing the scoop to make half a turn and deposit the coals in the retort. The scoop is withdrawn, the machine moved on to the next retort, and the operation repeated. All these motions are obtained by hydraulic power; the man simply stands and moves the levers or stopcocks; indeed, an intelligent lad would master the whole operations in half an hour, all is so simple, and so little muscular power being required, the water power doing all the hard work. Thirty retorts can be drawn and charged in 29 minutes, and a greater speed will be obtained when a better head of water is provided.

There cannot be the slightest doubt that these hydraulic stokers will soon find their way into all gas-works of any magnitude at home and abroad. From their admirable simplicity, the little room they occupy, the small amount of material used in their construction, the ease with which they are worked, and the little likelihood of their giving trouble by getting out of repair, they seem to be the very thing wanted at this crisis, when dear coal and sulky men render the life of a gas manager anything but pleasant.

For foreign gas-works, where skilled labour is not easily obtained, they have this advantage, that there is not a part about them liable to get out of order by ordinary wear and tear, but such as could be repaired by a common blacksmith. The writer advises every one who visits Glasgow, and has any interest in this matter, to endeavour to see these admirable machines, assuring him that he will not be disappointed. The engineer who gets them into his work may sleep on an easy pillow, so far as stoking is concerned, knowing that he has able servants always at their posts ready for duty, and who will never strike. They must prove a boon to gas companies, and are a credit to the inventor.

[We hope shortly to be in a position to supply a technical description, with suitable illustrations, of this ingenious apparatus. This description would have been published before now, had not domestic affliction rendered it impossible for the inventor to give his attention to the matter.—ED. J. G. L.]

Correspondence.

SEWAGE FARMS.

SIR,—I have seen in your JOURNAL several extracts on the sewage question, and knowing that you would afford information, or give publicity to discussion on any question of importance, I forward you the following remarks:—

In my opinion this question would have been long ago decided, if, in the majority of instances in which sewage irrigation has been adopted, it had been carried out by practical agriculturists, instead of by Town Councils and sanguine theorists.

Where sewage is dealt with in any quantity, two things are, I think, required—viz., under-drainage, and beds for downward filtration. Whether purification of the effluent sewage by lime to some extent is desirable before using it, is a question. In the two instances I will now give you, in which, irrigation is carried out by practical men with success, clarification of the sewage is not resorted to.

The first instance to which I refer is Heathcote Sewage Farm, near Leamington, the property of Lord Warwick. I believe it is about four years since this land was drained to some extent level; covered culverts were constructed for the mains, &c. The quantity of land under treatment has increased yearly, and is now something over 400 acres. Good substantial buildings have been erected for cattle, which are chiefly fed on rye-grass, with most satisfactory results. The land is freely supplied with sewage for two years, during which rye-grass or vegetables are grown; the third year the sewage is shut off entirely, and a crop of corn (good in quality and quantity) is taken. I have visited the farm yearly for the last three years, and find that the land is improving, and the produce increasing. The effluent water is passed away in a satisfactory state, and no complaints as to nuisance arise. Notwithstanding the wetness of the last two seasons, I am told that the last stocktaking showed that the whole outlay had been repaid and a small profit realized.

My second instance is a sewage farm belonging to the Corporation of Wrexham, North Wales. On this farm, two years ago, the town was losing money, its mismanagement rendered it a nuisance, and I believe the neighbouring landowners obtained an injunction against the corporation on account of its unsanitary condition. It was then advertised

by the authorities, and taken by Colonel Jones, one of whose first acts was to prepare two beds for downward filtration. The first year was a very wet one, but I learn that the farm is much improved, that complaints as to its sanitary condition have ceased, that the colonel and his children are living close to the farm, and that both they and the neighbourhood are healthy. It is only this week that the colonel told me he was making up his accounts for the 18 months he has occupied the land, and that he believed they would show a profit.

Mr. Tough, the Earl of Warwick's agent, and Colonel Jones are both reliable men, and will, I believe, have pleasure in furnishing any information that may be required.

W. KEMPSON.

South Fields, Leicester, Feb. 16, 1874.

Legal Intelligence.

ROLLS COURT.—THURSDAY, FEB. 19.

(*Before the* MASTER OF THE ROLLS.)

THE LATE GAS EXPLOSION AT HALIFAX.

COMMERCIAL UNION FIRE INSURANCE COMPANY AND OTHERS *v.* LISTER.

Mr. SOUTHGATE, Q.C., Mr. COHEN, Q.C., and Mr. KEKEWICH appeared for the plaintiffs; and Mr. FRY, Q.C., Mr. GRAHAM HASTINGS, and Mr. TAPPIN for the defendant.

This was a motion for an injunction to restrain the defendant from compromising an action or otherwise from injuriously affecting the plaintiffs alleged rights. The plaintiffs in the suit were eleven of the principal insurance societies of the United Kingdom—viz., the Commercial Union, West of England, Alliance, British and Foreign, Imperial, Manchester, Sun, Westminster, Royal Exchange, Atlas, Scottish Union, and Britannia Fire Offices. The defendant in the suit was Samuel Cunliffe Lister, carrying on business as a silk spinner and manufacturer, at Halifax, under the style of Lister and Company. This business was formerly carried on in two mills in Halifax—Wade Mill and Wellington Mill. On the 4th of December, 1873, an explosion of gas occurred at the Wellington Mill, by which and the fire arising therefrom the contents of the mill were destroyed. The mill in question was insured in the plaintiffs companies to the extent of £36,000, their liability to the extent of about £33,000 not being denied. The insurances were, however, alleged by the defendant to amount to £23,000 less than the damage sustained. As the fire was stated to have occurred through the negligence of the servants of the Corporation of Halifax, as the owners of the gas-works for the borough, the defendant had commenced proceedings against that body to recover the excess of damage over insurance.

Mr. SOUTHGATE said he had to move, on behalf of the plaintiffs, to restrain the defendant from suing the Corporation of Halifax, except for the whole amount of the damage done by the fire, or, in the alternative, that the defendant should allow the plaintiffs to use his name. The reason the plaintiffs had come for an injunction was that, although the corporation were liable for the whole of the damage occurring through their servants negligence, yet the defendant had expressed his intention to compromise the matter for £23,000. That, he submitted, the plaintiffs had a right to prevent his doing, as it was sacrificing their rights to recover the amount paid by them to the defendant. What the defendant was, in fact, going to do was to give up the right of the companies to his own interest, as one of the ratepayers of the borough. The plaintiffs were, therefore, entitled to an injunction.

Mr. FRY, for the defendant, denied that there was any obligation on his part to sue the corporation at all. The defendant had a beneficial interest in the cause of action, and the plaintiffs only had a right if the receipts exceeded the excess of damage. Was he bound to make the receipts exceed the excess?

A considerable discussion took place, in the result of which it was agreed that the plaintiffs should pay the total amount which the defendant should demand, as if he had had an open policy, the defendant undertaking to repay the whole or any part thereof which should not be recovered from the corporation, and the defendant's counsel arguing that part of the case which went to the question of consequential damage. At a subsequent period of the day,

Mr. SOUTHGATE said the order had been varied to the extent that the company should pay £44,000, instead of £56,000; but the consent of all the companies must first be obtained.

Mr. FRY asked that the case should stand till next motion to allow such consent to be got. No costs to either side.

The MASTER OF THE ROLLS acceded.

COURT OF CHANCERY.—FRIDAY, FEB. 20.

(*Before Vice-Chancellor* HALL.)

In re THE AIR GASLIGHT COMPANY, LIMITED.

The same counsel appeared for the several parties as on the former occasion.

Mr. LINDLEY, Q.C., said no doubt it would be in his honour's recollection that two petitions were presented to have the company wound up, one by Mr. Puckle, and the other by the directors; and, after some discussion, the petitions were ordered to stand over, for the purpose of having a meeting held to see whether the business should be continued or wound up in any and what way. That meeting had been held, and the result of it was stated in the affidavit of Mr. Henry Francis Gill, the secretary of the company. The affidavit, after referring to the direction of his honour that a meeting of the shareholders should be held, in order to ascertain their wishes, stated that the meeting was duly held on Wednesday, the 28th of January, when a resolution was proposed to the effect that a committe of seven independent shareholders should be appointed to ascertain the real position of the company, and whether it could profitably carry on its business, and asking the Vice-Chancellor to let the petition stand over until the report of that committee should be presented within three calendar months. An amendment to that resolution was proposed, to the effect that the committee be formed as proposed, but that the Vice-Chancellor be respectfully requested to dismiss the two petitions to wind up the company; and that if, after the report of the committee, it was found necessary to wind up the company, then that it should be wound up voluntarily. The amendment was carried by a considerable majority. The petitioners, although entitled to a large number of votes abstained from voting, neither did they in any way attempt to influence the result of the polling. A meeting of the committee appointed had already taken place, and they would proceed with all diligence in carrying out the objects of the resolution. Thus the question now arose, what should be done with the petitions. The petitioners, including the directors, who had a large number of votes, thought, considering their position as directors and petitioners, it would be fit and proper to abstain from voting, and consequently did not vote. But, on the other hand, Mr. Harrison, the great opponent of the petitions, did not abstain from voting, the consequence being that there was a majority in favour of the amendment. He asked that the petitions should not be disposed of until after the report of the committee was presented.

The VICE-CHANCELLOR was disposed to think that was the right course to take.

Mr. LINDLEY said the object of adjourning the petitions was that it might be seen what could be done. The committee appointed had full powers to investigate all books, and to call in chemists, accountants, analysts, and so on, and would therefore be able to see whether the company could successfully go on.

The VICE-CHANCELLOR thought it would be throwing away the machinery of the petitions to dismiss them, because ultimately it might turn out that there was a case for winding up.

Mr. LINDLEY hoped his honour would not make any order till the report was presented.

Mr. DICKINSON, who appeared in support of the petition of the directors, said the court was not hampered by a resolution to wind up voluntarily, because there was no such resolution. He did not think the petitions could be satisfactorily dealt with until the report of the committee was presented, and therefore he asked his honour to allow the petition to stand over until after that time.

Mr. GREENE said he appeared on behalf of a very large number of shareholders, who had most important interests in the concern, who thoroughly believed the invention was a most beneficial one, that the company would be prosperous, and that therefore the petitions ought to be dismissed. The directors who had been appointed to carry on the concern, instead of giving it a chance of success, had presented a petition without consulting the shareholders, or getting any authority to do what they had done. Such a thing was never heard of before. It was quite out of all rule for directors to present a petition to wind up so long as they had means to carry the concern on, and there were plenty of moneys not yet called up; therefore the petition should not have been presented. According to his honour's direction, as he had heard, a meeting had been held, and the result was that there was a majority of 968 votes in favour of the petitions being dismissed. Nothing could be more injurious to a company than to have a petition hanging over it, which would ultimately accomplish the end of the directors, who would come and say the company was then in a condition to be wound up, having been brought into that position by themselves. He could not imagine anything more injurious. They had had an opportunity of putting the facts before the shareholders, which they had done and lost, and now they wanted a second indulgence. The committee could investigate the affairs without petitions, and he therefore asked that they might be dismissed. The company had ample assets to go on with, the shares were not exhausted, and if the petitions were not in existence other shares might be taken up; but it paralyzed the whole undertaking. Therefore he asked his honour to do justice to his clients, and prevent the concern being ruined. The directors were trying to do everything they could to stop the company, but he hoped his honour would not encourage such an attempt to destroy the property which they were appointed to protect. If the directors had held a meeting before they presented the petition, and been authorized to present it, it would have been a different thing. No one would then have objected to an adjournment for investigation; but the petition was not presented properly in any sense of the term, and those who should protect the affair came to destroy it. Therefore he contended that the petition of the directors should be dismissed with costs. With regard to the other petition, presented by two shareholders holding 20 shares each, it was almost as unwarrantable as that of the directors. The accounts presented at the meeting were most unsatisfactory.

Mr. DICKINSON said his learned friend was not warranted in making that statement.

Mr. GREENE said they had no details or circumstances to judge by, and it was impossible to tell what the result of the affairs would be when properly investigated.

Mr. DICKINSON said there was no evidence to that effect. The directors were proceeding to go into the accounts at the meeting, but the shareholders thought they had better be investigated.

The VICE-CHANCELLOR said he could not attend to anything which was not stated on affidavit.

Mr. GREENE said, if the accounts had been complete, there would have been no need for a committee of investigation; and, by the appointment of the committee, the shareholders showed that they were not satisfied with the accounts. Mr. Harrison had made an affidavit stating that the meeting was held, and a resolution was passed by a majority of shareholders to appoint a committee to investigate the company's affairs, in consequence of the accounts being in an unsatisfactory condition, and thus to ascertain the solvency or insolvency of the concern. The question now was whether the petitions ought to have been presented. They had had an opportunity of showing whether they could justify the petitions to the meeting, but had failed to do so, because a large majority had passed a resolution asking his honour to dismiss the petitions. If the petitions were allowed to stand over for the committee to present their report, when the report was presented, if it was against the petitioners, they would still be dissatisfied, and ask for it to stand over again. In fact, there would be no end to the adjournments, and, at last, the property would be destroyed. One shareholder had filed an affidavit questioning the propriety of the meeting and the circumstances which took place at that meeting, which he thought he ought to be made to pay the costs of personally. On the whole, he (Mr. Greene) submitted that both petitions should be dismissed, and dismissed with costs.

Mr. SPEED followed on the same side, and submitted that after the meeting had been held, and a majority had decided that the petitions should be dismissed, his honour would accede to those wishes. The accounts presented showed a loss of £8,000, but there was a very large balance due on the shares still to be called up. The loss had been occasioned by three or four experiments, costing £2900, to show that the gas was capable of being made with advantage, and a sum of £5660 had been spent in salaries, directors fees, and law costs. Those expenses would not be continued in future, and therefore he thought there was every prospect of the company succeeding. He hen referred to the Suburban Hotel Company, and submitted that it stood on tall fours with the present case.

Mr. GRAHAM HASTINGS appeared for Mr. Burke and 51 other shareholders, altogether independent of Mr. Harrison, and also asked to have the petitions dismissed with costs. He referred to the *Factage Parisien* case and *Brighton Hotel Company's* case. At the meeting the majority had decided that if they found it necessary to wind up, they would wind up voluntarily; and the law was that where it was necessary to wind up, and the shareholders desired to wind up voluntarily, the court would not interfere. Treating the amendment as equivalent to a resoluotion to wind up, his honour could not interfere, because the shareholders did not desire the interference of the court. Partnership cases had no application to the present, because the Legislature had provided, in the 79th section, for the only grounds on which it would make a winding-up order, and none of those grounds existed in the present case. The directors had come to the court without consulting their *cestui que* trusts at all for a winding-up order; but when they did consult the shareholders, the result was that they agreed to ask that the petition should be dismissed. Keeping petitions hanging over would inevitably bring about the ruin of the company, and he therefore hoped his honour would dismiss the petition with costs.

Mr. KARSLAKE, Q.C., said he appeared for the company, but would leave the matter in his honour's hands.

The VICE-CHANCELLOR: I think the petitions should stand over. When the matter was before the court on the former occasion, the court wanted assistance in order to enable it to dispose of the petitions. The court is in the same situation now, and in that situation I am not going into the faults of the directors or any one else. But at the meeting the shareholders seemed all agreed that the affairs could not be investigated without the appointment of a committee. That committee is now in existence, and in due time a report will be made. Then I shall, upon that report, ascertain what the real intentions and views of the shareholders in this company are with reference to carrying on the concern. I think that is a reasonable thing, and, therefore, shall let the petitions stand over. If there be mischief to the company in presenting

the petitions, I am sorry for it; but the mischief is already done. But after the resolution which has been made for investigation, I do not think that there is any superadded mischief which should lead me to dismiss the petitions at once, particularly as the resolution contemplates, as one result, that the company will be wound up voluntarily instead of compulsorily. However, I cannot go into that. I am not in a situation to deal with the petitions at once, and, therefore, they will stand over.

Mr. DICKINSON: They will stand over until after the report is presented.

Mr. GREENE: No; let them stand till a particular time.

The VICE-CHANCELLOR: Let the petitions stand over generally, with liberty to apply. If there should be any improper delay in the proceedings of the committee, there will be liberty for either party to apply.

Mr. INCE said he appeared for some independent shareholders, and should be glad if his honour could see his way to adding one independent shareholder to the committee.

The VICE-CHANCELLOR said he could not do that.

In re THE JERSEY WATER-WORKS COMPANY.

Mr. DICKINSON, Q.C., said the petitioner in this case was a creditor for £2091, and was supported by other creditors, one for £8700, and four others for £4291 3s. 6d. Actions were pending against the company, and there was an apprehension that one small creditor was taking proceedings to attach the property for his own particular advantage above all the others. There was no question at all about the company being insolvent within the meaning of the Act, and there had been a meeting at which the company passed the usual resolution of its being unable, by reason of its insolvency, to continue, and liquidators were appointed. The petition was originally presented for a compulsory winding up, but, inasmuch as the petitioner had concurred in the resolution passed by the company for a voluntary winding up, and was himself named as one of the liquidators, all that was now asked was an order to continue the winding up under supervision, and continue the liquidators appointed at the meeting.

The VICE-CHANCELLOR made the order as prayed.

COURT OF EXCHEQUER.—SATURDAY, FEB. 21.

(*Sittings at Nisi Prius, at Guildhall, before the* LORD CHIEF BARON *and a Special Jury.*)

FELLWOOD *v.* PEARSON.

Mr. DAY, Q.C., Mr. MORGAN HOWARD, and Mr. ERSKINE POLLOCK were counsel for the plaintiff; Serjeant PARRY and Mr. REGINALD BROWN appeared for the defendant.

The plaintiff in this case is the widow of an army accoutrement maker, and she sued the defendant, who is a contractor for paving and other works, under Lord Campbell's Act, for the loss sustained by her in the death of her husband, through, as alleged, negligence on the part of defendant's workmen. The case for the plaintiff was, that on the 25th of August last her husband was walking along Union Street on his way to his work, and as he passed No. 16, all of sudden a terrific gas explosion occurred in the house, and he staggered against the railings, but, recovering himself immediately, he rushed into the house and rescued an old woman who was in it. When he got home he said to his wife that if the old woman felt as bad as he did she must be bad indeed. He got, it appeared, from bad to worse. He was suddenly seized with black vomit, and went raving mad. He raved about explosions, and died on the 18th of December, leaving a widow and three children. The defendant was a contractor for repairing the road in Union Street, and by reason of the negligence of some of his workpeople the gas-pipes were damaged, and, the gas escaping, earth was thrown in upon the pipes, and, although there was no communication by gas-piping with the house, the gas, either by means of a drain or by some other means, got into the house, and a fire being lighted, the explosion occurred. At the conclusion of the plaintiff's case,

Serjeant PARRY objected that there was no evidence to go to the jury. Even assuming there was negligence on the part of the defendant's servants, there was no personal injury inflicted upon the plaintiff by the explosion, but mere fright or shock produced on his system by the noise, and that would not be actionable, it being too remote. Supposing, for the negligence of which it was alleged the defendant's servants had been guilty, they had been indicted for manslaughter of the deceased, could such an indictment have been sustained on the evidence adduced? No such action as the present had ever been brought before. There was a case some years ago in which a plaintiff brought an action for injury to his health occasioned by the defendant publishing a libel of him, and it was held that such an injury was too remote, the direct consequences of a libel being damage to reputation, and not injury to health. The direct consequences of an explosion of this kind would be physical injury, whereas here only a mental shock had been sustained.

The LORD CHIEF BARON said there was a manifest distinction between injury to health caused by a libel and injury to health caused by an explosion, notwithstanding in the latter case there might be no apparent external physical injury. The natural result of a great explosion was to displace with violence a great body of air, and that of itself might occasion severe injury without leaving external marks. In many cases of railway accident people sustained what was termed a shock to the nervous system, which frequently resulted fatally, although no external injury was perceptible. He thought the question of injury was one for the jury.

A consultation hereupon was held between the counsel on either side, and by agreement a verdict was entered for the plaintiff for £150, £100 of which was apportioned to the widow, and £50 to the children.

CLERKENWELL COUNTY COURT.—WEDNESDAY, FEB. 18.

NEW RIVER COMPANY *v.* MAYER.

(*Before Mr.* WHITBREAD, *Judge.*)

This was an action brought to recover the sum of 16s., being the balance of four quarters water-rate, due at Christmas last, from the defendant, in respect of his premises, No. 9, Hasting's Street, St. Pancras.

Mr. POPHAM, solicitor, who conducted the case, said the plaintiffs were a company incorporated by a Royal Charter, granted to them by James I., for the purpose of supplying the metropolis with water. Several Acts of Parliament had been passed from time to time relative to this company, and by the New River Company's Act, 1852, it was enacted that at the request of the owner or occupier of any house the company should supply water for domestic purposes to such owner or occupier at the following rate:—"For water supply to any dwelling-house where the annual value of the dwelling-house shall not exceed £200, at a rate per cent. per annum, on such value, not exceeding £4." In this case the defendant occupied a house which was rated upon the parochial books at £18. He paid a rent of £20, and the plaintiffs had assessed him at the rate of £22; that being the value of the house in the valuation list. A correspondence had taken place between the plaintiffs solicitor and the defendant, which would really show the point in dispute in this case. In a letter of April, 1873, the defendant contended that the actual annual value of the house was £20, although it was entered on the valuation list at £22, and the rateable value was £18, and he claimed to have the water-rate calculated upon the basis of the annual rateable value. It was provided by the 32 & 33 Vic., cap. 67, sec. 45, that the valuation list should be conclusive evidence of the gross value and rateable value of the several hereditaments included therein—that is to say, for the purpose of any of the following rates, which were made during the year that the list was in force. Section 6 enumerated certain rates and assessments, and concluded by stating, "And every other rate, assessment, or contribution levied, made, and required in the metropolis on the basis of value." He contended that the section referred to by the defendant had no reference to this case, because by the 54th section of the same Act it was provided that nothing in the Act should affect any exemption, or deduction, or allowance out of any rate whatever, or any provision for being rated or taxed on any exceptional principle of valuation. Here there was an exceptional principle of valuation, because the company's Act already referred to specified distinctly the rate and principle of valuation. The company were entitled to charge upon the annual value, and upon reference to the 4th section of the Valuation of Property Act the annual value meant what the tenant might reasonably be expected to pay for the hereditament. The defendant, by his letter, had admitted that he had to do certain repairs, and that the landlord had allowed him £40, on account of those repairs. In order to ascertain the tenant's annual value, this must be taken into consideration, and the entire expenditure would form the annual value, so far as the tenant was concerned, and although the defendant only paid £20 for his house, the other expenditure made its value, according to the valuation list, £22, upon which the company sought to recover their rate. He contended it was not in the power of the judge to inquire into the question of annual value. The 74th section of the Act of 1847 gave the company a right to sue in the county court, and all they had to do was to prove the rate owing, and it was not competent for the defendant to dispute the valuation. If he did so, then he must go to the justices, under the 68th section of that Act.

The JUDGE said the company knew of the dispute, and they ought to have gone to the justices to settle the annual value.

Mr. POPHAM said the company, under the authority of their Act, had made a rate, and they were satisfied with its correctness. They could not on the one hand make a rate, and then dispute it. It was for the other party to dispute what the plaintiffs had done.

The rate was then formally proved, and also the amount due.

The *Defendant*, who conducted his own case, submitted that the plaintiffs were bound by the rateable or actual value of the premises, and, on the authority of the *Sheffield Water Company v. Bennett*, contended that the annual value was the value after all deductions were made.

Mr. POPHAM, in reply, argued that, in the case referred to by the defendant, the value meant was the landlord's value, and not the tenant's, and that it therefore did not apply in this case. Further, that case was decided upon the Sheffield Water-Works Act, which expressly sets forth the amount of rents, upon the basis of which the rate was made, whereas the company's Act gave them the annual value.

The JUDGE said the question was really as to whether the water-rate should be made upon the rateable value, or upon the gross value of the house, or, strictly speaking, really what was the actual value of the premises. His honour quoted largely from various Acts of Parliament, and referred to several reported cases bearing on the subject, and said he was not bound by the rateable or gross value, but was entitled to say what was the annual value of these premises, and give his judgment accordingly. He was of opinion that the rateable value was not the test, but that the rent which the tenant paid to the landlord was the annual value. In his opinion the defendant must pay upon £20, and not on £18, and he gave his judgment accordingly.

Mr. POPHAM asked for leave to appeal.

The JUDGE thought it would be uncommonly hard upon the defendant for such a small amount as this.

The *Defendant* said he had no objection to the appeal, as the case was one that ought to be definitely settled.

The JUDGE said, as the defendant had no objection, he would grant the required leave.

SOUTHWARK POLICE COURT.—MONDAY, FEB. 16.

(*Before Mr.* BENSON.)

COMMITTAL FOR REFUSING TO PAY GAS-RATE.

Henry Barton, a licensed victualler, late landlord of the Talbot Inn, High Street, Borough, was summoned by the Phœnix Gas Company for refusing and neglecting to pay the sum of £4 18s. 11d. for gas supplied to that house from the 3rd of October to the 13th of December last.

Mr. *Deane*, a collector in the service of the company, said that the defendant generally paid the rate every month. He neglected to do so latterly, and when the inspector went to the premises, on the 13th of December, he had left, but on examining the meter it was found that 26,200 feet of gas had been consumed since the 3rd of October. The account was placed in witness's hands for collection, but for a long time he had a great difficulty in tracing the defendant. At last he found him in lodgings at Clapham. He left the account with his wife, and afterwards a notice was served at the same house that proceedings would be taken against him. He, however, took no notice whatever of this, and the present summons was issued.

William Price, a sub-inspector in the company's employ, said he went to the Talbot Inn, High Street, Borough, on the 13th of December, but no one was in the house. He, however, got access to the meter, and found 26,200 feet of gas had been consumed.

Defendant, in answer to the complaint, said he had been in the house nearly three years, and had always paid his gas regularly until latterly. On the 8th of December he sold the house to Mr. Naylor, and intended to have paid for the gas.

Mr. BENSON asked him if he gave the company any notice of his leaving the house.

Defendant replied in the negative. If a few days were allowed he would settle with the company.

Mr. *Deane* informed the magistrate that defendant had had every opportunity of settling with the company. *Witness* had great difficulty in finding him, and he had no goods to distrain upon.

Mr. BENSON sentenced him to six weeks imprisonment, in default of goods to distrain upon.

The defendant was removed to Horsemonger Lane Gaol.

BRIGHTON POLICE COURT.—TUESDAY, FEB. 17.

CONVICTION FOR WASTING WATER.

The Rev. *James Richard Rumsey* was summoned by the corporation for wasting water.

Mr. J. A. FREEMAN (town-clerk) having stated the facts, called

Mr. *A. Colman*, an officer in the service of the corporation, and employed at the water-works, who stated that on the 5th inst. he visited the defendant's residence in consequence of something which he had heard. He was shown the water-closet, from which the water was running away at a great rate, and could not be stopped by either pulling up the handle or pressing it down. He then went up to the cistern, and the water was pouring into that as fast as it ran away from it into the closet; and on attempting to shut it off he found that the ball-cock would not work. In reply to the bench, witness said the water was running away at the rate of two gallons a minute, or about 3000 gallons a day.

Mr. *Bostel*, the owner of the house, was called as a witness for the prosecution, and produced a letter which he had received from Mr. Rumsey, on the 7th of February, in which defendant said, "Let me urge you to give your immediate attention to the water cistern. You have no idea what the waste has been. It is running day and night."

Defendant pleaded "Not guilty," contending that it was the duty of the landlord to see to all outside repairs.

Mr. BIGGE asked him what was to be done in the event of the landlord being hundreds of miles away, and, perhaps, abroad. Besides, it was impossible for the authorities to know who the landlords were.

Defendant said the waste arose from the ball-tap in the cistern at the top of the house being out of order; and as it was outside, the cistern was landlord's repairs as much as a slate.

Mr. VERRALL (magistrate's clerk) said tenants had the control of their houses, and landlords could not come into them without the tenant's sanction.

Mr. BIGGE said there was no question that the occupier was the responsible party in these matters, the same as with the payment of poor-rates.

Defendant was fined 20s. and costs.

Miscellaneous News.

THE ECONOMICAL CONSUMPTION OF COAL.

First Notice.

THE PEEL PARK EXHIBITION.

A most interesting exhibition has been recently opened at Manchester, under the auspices of the Society for the Promotion of Scientific Industry, in which economy of the use of coal for manufacturing and domestic purposes is the chief feature.

In the absence of Mr. Lothian Bell, an address prepared by him was read by the Secretary of the Association at its opening. In this he referred first to the necessity of artificial means of heating for domestic and manufacturing purposes, and traced the history of fuel employed for such objects from the earliest to the present times. Wood, of course, was the first source of fuel, but the requirements of modern times, even in the best wooded countries, would necessarily be unsatisfied from such sources. He then referred to the question of the possible exhaustion of our coal-fields, and very justly animadverted on the shameful waste that is prevalent in the United Kingdom in respect to the raising and consumption of coal. The least expensive coal in cost is that first raised, and consequently an enormous loss of fuel that might be advantageously employed, occurred. He referred to an apparent want of labour in colliery work, but very properly left the question for settlement to the adjustment between supply and demand. In respect to the use of coal, he laid great stress on the waste which ensued from the non-consumption of so-called smoke, and to avoid this really national sin, he expressed himself as rejoicing in the establishment of a society whose objects were to economize the use of fuel for every possible purpose to which it could be applied. Of the 120 million tons of coal now used or raised in the kingdom, he considered that about 20 million tons were absorbed in the manufacture of pig iron, and that, in many instances, most wastefully. Another instance of coal waste was found in the manufacture of coke for smelting and locomotive purposes; and with respect to steam power, he estimated that at present we only obtain from 10 to even as low as 5 per cent. of the heat-value of the coal consumed. The waste of coal in our domestic arrangements was strongly deprecated. He then referred to what had been done by the mathematician and chemist in leading us to the economical employment of fuel, concluding with expressing the hope that the society's object would be amply realized in promoting a more economical consumption of our national fuel.

The arrangements of the exhibition, in regard to inventions shown, involved a series, of which the most important were the following:—1. Appliances that could be adapted to existing furnaces for steam production, whereby improved combustion of coal would result, and consequent saving of fuel. 2. Appliances that might be adopted, by which the heat, at present wasted in the escape of gaseous products up the shaft, might be utilized together with that of the exhaust steam. 3. Appliances by which existing steam-boilers, pipes, and engines might be so covered as to prevent loss of heat by radiation and condensation. 4. New or improved furnaces (using solid, liquid, or gaseous fuel), with boilers, &c., specially adapted for the saving of fuel. 5. Natural and artificial fuels. 6. Coal-cutting and peat manufacturing machines. 7. Domestic and other fire-stoves, ranges, and apparatus of all kinds (using coal, gas, or other fuel) for cooking, and for warming rooms. The eighth division was the receptacle of miscellaneous inventions, involving a variety of the details, carrying out the objects of the exhibition in a supplementary manner.

It is very difficult to select, from the numerous exhibits, those most deserving of notice. It appears that the exhibition itself was incomplete, simply because the society had neither time nor funds sufficient to gather together full illustrations of the most recent discoveries bearing on the question of economy in the use of various kinds of fuel. On this point it must be borne in mind that the enormous increase in the price of coal during the last two years has stimulated inventive genius to an extent previously unknown in this direction. In respect to the first class—that is, appliances which may be used in existing furnaces to economize fuel—there were about 30 exhibitors. Among the inventions of interest was a mechanical stoker, similar to an arrangement, so far as we can judge, of one illustrated in Tredgold's work on the steam-engine, published many years ago. "Mechanical Stokers" were generally an important feature, and by some of these slack can be used advantageously in many instances in place of round coal, in some cases causing a saving of some 25 per cent. Mr. Dillwyn Smith was an exhibitor of this kind of stoker. By this invention the fuel is conveyed by a screw, working right and left, from a large hopper, to a couple of fans, by which it is regularly distributed over the fire, the amount of the coal thus supplied being regulated according to the requirements of the engine or boiler. Among the smoke-preventing arrangements may be mentioned that of Young Brothers, of London, by which the fire is fed from the bottom of the furnace; the principle being that of two grates working on an axis, and the smoke, passing through the red-hot coked coal, becomes converted into gaseous products. Messrs. Martin and Co. exhibited a patent system of furnaces in which the fire-door works from the top instead of the side, opening either inwards or outwards, and through careful balancing can be made to rest in any desired position. Another invention, by Mr. Irving, has the advantage of regulating the consumption of fuel by the pressure of the steam acting on a damper fixed in the flues, which thus controls the draught and admission of air into the furnace. Many other inventions were exhibited, tending, according to the views of the owners, to economize fuel for manufacturing purposes. In all cases of this kind, to be really successful it is requisite that an accurate adjustment should be made between the supply of fuel and the combustive power of the grate or furnace. In other words, the arrangement must be automatic, and we are almost afraid that the exact adjustment we refer to is yet but partially realized. Other points for consideration are the varying quality of the coals employed, the amount of moisture they contain, the temperature and moisture of the external atmosphere, and a variety of other conditions too numerous to notice in this brief account of the exhibition.

In economizing fuel by heating feed water many inventions were shown, the chief points aimed at being those of the prevention of scale formed inside of the tubes, and of producing the largest amount of heat, whether from exhaust steam or the escaping heated gases of the furnace. Among these were exhibits of Erskine, Bell, Twibill, Green, &c. The success of all such inventions will much depend on local conditions. With comparatively soft water—that is, water free from both carbonate and sulphate of lime—they may all act well; but our experience with hard water leads us to believe that many of them would fail if exposed to long and severe tests under such conditions.

We are glad to notice that the question of economizing fuel for domestic purposes received much attention. At least three-fourths of the fuel used in our houses are wasted, while the annoyance of smoke from them is not in the least diminished, for all legal measures simply deal with smoke as emitted from manufacturing chimneys. Some of the arrangements in the "Kitcheners" were admirable illustrations of what a little fire may do for roasting, boiling, stewing, and other culinary matters. The essential points are a good draught, and the regulation of the passage of heat from the burning fuel to each department of the range. Gas stoves of all kinds were largely exhibited, and when the foolish prejudice which exists against this kind of heating and cooking plan is exploded, many of the valuable inventions now extant will doubtless become largely adopted.

Examples of what peat may perform in competition with coal was shown in great strength. Prominent among the peat manufacturing machinery was that of Messrs. Clayton, Sons, and Hewlett, which, according to their statement, is capable of being so worked as to produce compressed peat on the spot, at the rate of some 4s. to 5s. per ton. The first part of this process consists in pressing out the water, then reducing the comparative solid to a pulp, and subsequently drying it for sale. Other plans of dealing with peat as a substitute for coal were exhibited, among which may be named Kidd's process, by which the peat is cut up into blocks and dried. Another process for dealing with peat, exhibited by the Peat Engineering and Sewage Filtration Company, was that of passing the peat in its ordinary condition through a pug-mill; after which it is cut into blocks, and submitted to the heat of superheated steam and the products of the combustion of the furnaces, by which, in a period of 48 hours, it is converted into a marketable article. Another process, the results of which were exhibited, was that of M. Challeton de Brughat, which professes to convert peat into veritable coal, and, according to the statements made, the result seems to be satisfactory. Numerous other instances of the utilization of peat were shown, which we forbear for the present to describe, simply because we desire to see definite results in preference to *ex parte* statements.

We should have been glad to have seen more examples of coal-cutting machines for use in mines. So soon as these are generally adopted, we shall have less chance of abnormal rises in the price of coals. The success of our cotton and other textile manufactures has been secured from strikes of the operatives simply because employers have further utilized machinery. Coalowners seem to have to learn a lesson in this respect. At present they are entirely dependent on the caprice of the miner, who is master of the situation. If he choose to work, the owners get their property into the market, and the public get fuel. It is questionable whether there is any form of our national industry so backward as that of coal getting. Exhibitions of the kind we have described will tend to great improvements, and meanwhile we congratulate the society on even the apparently partial success which has attended their efforts.

BRYMBO WATER COMPANY.—The half-yearly meeting was held on the 18th inst.—Mr. W. H. Darby in the chair. The report stated that the receipts on capital account amounted to £17,239, and the expenditure to £16,848 5s. 3d., leaving an excess of receipts over expenditure of £390 14s. 9d. The revenue account showed gross receipts from the 30th of June to the 31st of December to the amount of £749 (as compared with £590 last half year), and, with the balance of last half year of £39, amounted to £789, from which was deducted the usual expenses, amounting to £238, leaving a net surplus of £550. The directors recommended that a dividend be declared at the rate of £6 per cent. per annum, free of income-tax, carrying forward a balance of £48.

BODMIN GAS CONSUMERS COMPANY.—At the annual meeting last week—Mr. S. Hicks in the chair—the report presented by the directors, stated that the enlargement of the scrubber and the erection of an exhauster had effected a great saving in the carbonization of coal. The ammoniacal liquor, previously a refuse material, was now being manufactured into sulphate of ammonia, and fully realized the anticipations of the directors. It was believed that the outlay on these extensions and improvements would prove a source of permanent profit. The accounts showed a balance of £426, and it was recommended that a dividend of 8 per cent. should be declared, and a portion of the surplus, amounting to £71, applied to the reserve-fund, the remainder being appropriated to depreciation of plant. It was also proposed to allow a discount of 3d. per 1000 feet on all accounts paid within a month after quarter day, thus virtually reducing the price to 6s. 3d. per 1000 feet. The report having been received and adopted, Commander Liddell suggested that as soon as convenient the price of gas should be reduced to 6s. per 1000 feet, and this suggestion was referred to the directors. The chairman remarked that the present price was about the lowest in the county, and he did not conceive that 8 per cent. was at all high for a gas company, because they must remember that gas was a very precarious property, and also that scientific men were using every effort to invent some cheaper and more brilliant light. If that were done, where would their property be? Dr. Hichens moved that the price should be reduced by 6d. per 1000 for prompt payment. He was not, he said, a consumer, but this being a consumers company they ought to study their interests. The motion was not seconded. Mr. S. Hicks and Mr. G. P. Parkyn were re-elected directors, and Messrs. J. R. Collins and E. T. Crabb auditors. Mr. Sowden said that the manager had been in their service 8½ years, and his salary being the same now as it was at first, he suggested that the directors should consider the propriety of an increase. Votes of thanks to the chairman and directors, for their services during the past year, were unanimously carried, and also votes to the auditors and secretary. Mr. A. C. Sandoe remarked that the company were very greatly indebted to their manager, Mr. Thomas, for the great interest he had always taken in the welfare of the company. He considered a great measure of their prosperity was owing to his efficiency and attention to their interests, and he therefore moved a vote of thanks to him, which was unanimously adopted.

IMPERIAL GAS ACT, 1869.

BOARD OF TRADE COMMISSION.

Commissioners—F. S. Reilly, *Esq.*, *Chairman*; *Professor* Odling, *F.R.S.*, *and* W. P. Pattison, *Esq.*

The commissioners appointed by the Board of Trade upon the application of the Imperial Gas Company, under the 25th section of their Act, 1869, commenced their sittings on Thursday last, in Committee-room A, House of Lords. The revision clauses in the Imperial Gas Act, 1869, are identical with those of the City of London Gas Act, 1868, under which the inquiry in reference to the Chartered Company was made last year, with the exception, first, that the former requires the hearing before the commissioners to take place during the month of February, and the award to be made ten days thereafter, whereas in the latter there is no limit as to time; second, that in the case of the Imperial Company the Metropolitan Board alone are the local authority to be heard in opposition to the application, and in the case of the Chartered Company, the Corporation of the City of London also; and, thirdly, that the Imperial Company are entitled to ask that their reserve-fund, amounting to £81,250, shall be made up in addition to their maximum dividend, and their contingency-fund also, if not already made up, whereas the Chartered Company, not having either reserve or contingent fund, can only ask that the insurance-fund, amounting to 1 per cent. upon their capital, shall be made up in addition to their statutory dividend.

Serjeant Sargood opened the case for the company, on Thursday last, in a speech of some length, in the course of which he traced the history of the company from its formation in 1821 down to the present time, and pointed out the various Acts of Parliament under which their capital had been increased. He called attention to the obligations imposed upon the company by the Metropolis Gas Act, 1860, obligations which compelled them within a few years thereafter to seek additional powers from the Legislature to enable them to extend their manufacturing operations. He detailed the opposition offered to the bills promoted by the company in 1866 and following years, by which their plans for erecting new works were for the time frustrated, although fresh capital was given them for the extension of existing works. In 1869, the company finding it impossible to carry on their business longer on their old works, again applied to Parliament, and received power to raise the sum of £975,000, and to acquire 150 acres of land at Bromley for the erection of a new establishment. At that time, for the sake of obtaining the powers they required, they conceded certain of the demands made in the previous session by Mr. Cardwell's committee, and the revision clauses which had been incorporated in the City of London Gas Act, 1868, were in principle incorporated in their Act. Under those clauses they applied for the present revision. Their position was this: their stock and share capital amounted to £2,655,665, and to pay their statutory dividends of 10 and 7 per cent. respectively on this sum, they required £232,697. The reserve-fund, which when full amounted to £81,250, had been reduced before the last half year to £75,425, and as the profits of the last half year were insufficient to pay the dividends to which the shareholders were entitled, the company had been obliged to draw from that fund the sum of £41,646, leaving a balance only of £27,065. They, therefore, asked to have the deficiency in this fund, £52,302 made good, in addition to the dividend for the current year. The total amount required was £235,999. The estimated profit for the year 1874, including the interest receivable on the reserve-fund, was £94,956, leaving the amount to be made up by an increase in the price of gas, £191,043. It was estimated that an increase of 13d. per 1000 in the price of gas on the consumption of 1874 would yield £193,862, which was the addition the company asked the commissioners to make.

Mr. *John Field*, the company's accountant, was examined at length as to the capital raised, the income and expenditure of the past year, the estimated revenue and net profits of the current year, and the sum necessary to be added to the price of gas to make up the dividend and reserve-fund in 1874.

Mr. *T. N. Kirkham*, engineer-in-chief to the company, was examined in reference to the new works at Bromley, the necessity for their erection, their magnitude, and the demands which would be made upon the finished portions of them, to maintain, in conjunction with their other stations, the demands made upon the company for gas. He was also examined as to the additional expenditure to which the referees instructions subjected the company with respect to purification.

On Friday, at the sitting of the commissioners, Mr. Field was recalled, and, at the request of the court, produced a table showing the actual financial position of the company, and a comparison of the same with that of other metropolitan companies, and he was further examined in reference to the accounts submitted on the previous day. Mr. Kirkham was then recalled and examined as to the extent, capability, and cost of the new works at Bromley, and the rate of increase in the demand for gas. Mr. Chubb, the secretary, was the next witness, and he confirmed the evidence of the engineer as to the necessity for the capital expenditure since 1869, in consequence of the increasing business of the company. He also deposed to the accuracy of the data upon which the accountant had estimated the returns for the current year, and agreed with him as to the probable rate of increase in the demand for gas. He was examined as to coal and other contracts, the mode in which the company had raised their new capital, and the necessity they were under, in a business of this extent, to maintain a large floating capital.

On Saturday, the first witness was Mr. C. Parkes, the official auditor of the accounts of the company, who, in reply to the chairman, declined to give an opinion, although he expressed a doubt whether the commissioners, in dealing with the application before them, could take into account the expenditure on capital. As far as the consumers were concerned, the first point to be considered was, what quantity of gas ought to be made from a ton of coal, and what quantity of the gas made could be sold by the company. That was, he thought, the real question involved in the inquiry. It went to the root of the whole thing as regards the question of price. In comparing the cost of manufacture with that of other companies, a variety of questions had to be considered; there was the question of the cost of the site, and the cost of the works, as well as the question of finding a market for coke; it was exceedingly difficult to arrive at a satisfactory conclusion on the subject. As to whether the question of expenditure on capital account came within the scope of the inquiry, he would rather not offer any opinion on the point. Mr. Kirkham was again called and examined by the commissioners with reference to improved processes in the manufacture of gas, and the mode of purifying both by lime and oxide of iron. Mr. Richards, the governor of the company, followed, and went at great length into the affairs of the company, showing the necessity they were under to erect the new works, and justified the policy of the directors as to the way in which they had raised new capital for the purpose. At the conclusion of the evidence of Mr. Richards, it was announced by Serjeant Sargood that this was all the evidence to be produced in support of the case for the company. The inquiry was then adjourned until Thursday next, when the case in opposition on behalf of the Metropolitan Board will be opened.

Thursday, Feb. 19.

Serjeant Sargood and Mr. Bidder appeared for the company, and Mr. Cripps, Q.C., and Mr. Philbrick for the Metropolitan Board of Works.

Serjeant Sargood said he had the honour to appear before the commissioners, on behalf of the Imperial Gas Company, to introduce the facts connected with that company, with a view that their application to the Board of Trade, which had been entrusted to the commissioners, might be considered, and that the company might, having regard to the exigencies of their present position, be so dealt with as that they would be enabled to give to their shareholders the statutory dividend to which they were entitled, and might create, or rather make up—for they were already created—the two funds, the reserve and the contingency funds, to which also they were entitled by Act of Parliament. And at the outset he might venture to make one observation, about which there would be no difference of opinion between the representatives of the company and the learned counsel on the other side. It was this, that he thought the public and the company might congratulate themselves upon the fact that this inquiry was submitted to the same commissioners who dealt with a similar inquiry for another company last year, because they were all so clearly alive to the great care and attention which the commission bestowed on the general question then, and the mastery they acquired of its details, as well as the principles upon which it should be governed. He was sure that he expressed alike the satisfaction of his opponents and of himself that they were now before the same tribunal. The company which he represented felt especially the benefit of the great care which the commission bestowed upon the case of the Chartered Company last year, and the favour which they did to gas companies in general and to the public at large, in condescending to give, in addition to their award, an elaborate statement of the inquiries they had made, and the particular view which they took with regard to the principles by which they were governed. This had been to the company a great assistance in preparing the case now to be brought forward, for they felt that they were not coming for the first time on barren ground to discuss abstract questions which had not been previously considered; and as they had no ground for supposing that the commission were otherwise than unanimous in the opinion they expressed on the last occasion, and had also no reason to suppose they had since altered that opinion, the company felt themselves bound to bend to those views, as if they were trying the matter in another court, and to model their case in accordance with the opinions then expressed. The origin of the Imperial Gas Company dated back somewhat more than half a century, having been first incorporated in 1821, and after passing through very important phases of existence, with the addition of one or two private Acts, they were in the year 1854 reincorporated under a new Act, which contained short and succinct recitals of their previous history, and by which Act they were brought under the provisions of the Companies Clauses and the Lands Clauses Consolidation Acts, 1845, and the Gas-Works Clauses Act, 1847, except so far as those General Acts were varied by special provisions in that Act. In 1860 the Metropolis Gas Act was passed, and the Imperial Company, in common with all the London companies, were subjected to its provisions. In the year 1865, the company, finding themselves in a considerable dilemma with respect to the obligations under which the General Act of 1860 had placed them, which Act made it no longer optional, but compulsory on them to supply their district with an adequate quantity of gas, they promoted a bill to enable them to raise fresh capital, and enlarge their works. The bill, however, was thrown out in committee, and the company were left with all their obligations upon them without the means of providing for their fulfilment. In 1866 they again came before Parliament with the same object, but Parliament would not listen to their application to erect new works, though they were allowed to raise an additional capital of £325,000 for the purpose of improving their then existing works. Parliament, in its wisdom, seemed to think that it was in the interest of the public to put off the question of the erection by the company of new works, and that it was better to allow them to raise money for the improvement of the old works as far as they could. In the two following years the company again came begging for authority to purchase land and erect new works, but were again refused, unless they would accept the terms laid down by Mr. Cardwell's committee, which they were not prepared to do. However, in 1869, it became imperative that they should obtain the powers they sought, and they made certain concessions to the pressure put upon them by Parliament, the result being the passing, after a most elaborate investigation, of the Imperial Gas Act, 1869, under which the present inquiry proceeded. In this Act the revision clauses of the City of London Gas Act, 1868, were incorporated almost verbatim, so that the *modus operandi* for revision, its objects, and the rules by which it was controlled were to a great extent similar to those which had already engaged the attention of the commission. The main differences were these:—The City Gas Act dealt generally with a dividend as of 10 per cent. upon the whole existing capital, with only a sort of special saving clause that if there was any capital of any other description at a lower rate, the question was to be dealt with as though the lower rate had been mentioned, instead of 10 per cent. But it happened with the Chartered Company that there was no lower rate mentioned, and therefore it remained at 10 per cent. The Acts of the Imperial Company, however, gave 10 per cent. on all the capital existing in 1869, and only 7 per cent. upon the new capital of £975,000 which the company were then authorized to raise for their new works. In the City Gas Act, which was the Act under which the Chartered Company applied for a revision, the phraseology was "Capital paid up and expended;" in the Imperial Act it was simply "Capital paid up." In the City Gas Act an insurance-fund was created; under the Imperial Acts there were reserve and contingency funds. These were the main distinctions between the two. In both cases, whenever there was a surplus profit more than enough to pay 10 per cent. and to fill up the funds, the amount was to be carried over to the accounts of the following year. With respect to illuminating power, the Imperial Company were fixed to a minimum of 14 candles, and the Chartered Company to 16 candles, but the maximum price was the same in both. The only difference in the revision clauses of the two Acts was that by the Imperial Act the commissioners were bound to hear the case in the month of February, and to give their decision within ten days of the hearing; in the City Gas Act there was no limitation as to time. In the case of the Imperial Company the Metropolitan Board of Works took the place of the corporation, and on the Imperial Company's revision the commissioners had specific directions to fix a price which should yield the maximum dividends and make up the reserve and contingent funds; on the Chartered Company's revision it was the insurance-fund only in addition to the dividend. What were the principles by which the commissioners were to be governed, and which it was important to bear in mind in the conduct of this case? For these he was indebted to the memorandum which last year the commissioners themselves circulated in conjunction with their award. By clause 9 in that memorandum the commissioners declared that though, on behalf of the consumers, it had been contended that it was discretionary with them to allow the insurance-fund, they believed the section of the Act referring to this matter made it obligatory. The phraseology of the revision clauses of the Imperial Act being the same, he (Serjeant Sargood) would argue that the commissioners must also look upon it as obligatory upon them to make up the reserve and the contingent fund of this company. Their case would be submitted with that particular view, and their calculations would be directed to the accomplishment of that end. With regard, however, to the contingent-fund, he might state that, inasmuch as it was now full—£50,000—the company did not ask for anything to be put on the price of gas as to that. As to the distinction between share capital "paid up" and "expended," and the share capital paid up but not expended, the consideration would be important, because the company had a large amount of share capital entitled to dividend, and upon which dividend had heretofore been paid and sanctioned. By clause 12 of the commissioners award last year they drew the distinction, and they stated that they considered that in observing the rules of section 68 of the City of London Gas Act they had to look to a

dividend of 10 per cent. "on the share capital authorized, paid up, and expended, and to an insurance-fund of 1 per cent. on the capital paid up, whether expended or not." But the phraseology of the Imperial Act was, with respect to share capital, "paid up," and nothing was said about expenditure. The company had heretofore paid dividends on paid-up capital, and they claimed to be so entitled. They asked the commissioners—recognizing their decision—to accept from them this proposition—that they were entitled to dividend on the paid-up capital, which, in point of fact, meant floating capital. The floating capital in such a concern must vary from time to time, sometimes larger, sometimes smaller. There might be epochs of time at which from an influx of calls, a much larger amount of capital would stand to the credit of the company's accounts than another. Having made these references to the principles which he considered necessary in opening the case and bearing importantly upon the inquiry, the learned counsel proceeded to consider the three questions of dividend, reserve-fund, and contingent-fund, pointing out the special provisions in the company's Acts bearing upon them, and the mode in which they had been dealt with. He came then to the question of the actual position of the company, and to the statement of what they required at the hands of the commissioners. The company, he said, had a share and stock capital of £2,655,665, and the dividends of 10 and 7 per cent. respectively on this sum, amounted to £232,697 per annum. The authorized amount of their reserve-fund was £81,250. That fund was not full, but there was a considerable amount standing to its credit at the end of 1873. The company, however, in order to make up their statutory dividends for the half year ending the 31st of December last, had to resort to that fund, and the balance then left, with the interest on its investment would amount to £27,948, so that the deficiency to be made up would be £53,302. The two sums together amounted to £285,999. The estimated profits in 1874, including the interest on the contingent-fund, after paying interest on loans and the cost of the present inquiry, was £94,956, leaving a total deficiency, which they asked the commission to provide for, of £191,043. The details of these figures had been supplied to the Metropolitan Board. After receiving the answers to the interrogatories put by them to the company, the board wrote to the secretary, on the 14th inst., a letter in which they said, "The advisers of the board have had under consideration the answers of the company to the questions submitted by the board on the 23rd ult., and having inspected the works at Bromley, the board is of opinion that there has been an unnecessary expenditure of capital, having regard to the results to be achieved, and that buildings which would have been adequate to the requirements of the company might have been constructed at much less original outlay, involving a reduced working expenditure, and the board will think it their duty to submit to the commissioners that the requirements of the company might be satisfied by a less expenditure upon works of an improved design. The board thinks it proper at once to call the attention of the company to the above points, upon which evidence will be adduced." This intimation from the board involved principles for consideration which ought not to be passed over in silence. What, in the opinion of the board, "the results to be achieved" were, after the visit they made to Bromley, it was impossible to divine; but, in the opinion of the gas company, it was their duty, when Parliament had listened to their application, and given them capital for the erection of new works at Bromley, not to begin by putting up a retort to-day for the purpose of next week, and another next week for the purpose of the following week, but, anticipating the exigencies of the future, to set to work at once and erect works adequate to meet the reasonable requirements of their business for some years to come. They might possibly have over estimated "the results to be achieved," and anticipated a larger demand upon them than would actually be made, but surely the Metropolitan Board should be the last body in the world to raise an objection on that ground, seeing that all their own energies, and the enormous expenditure to which they put the public, were directed principally to the future benefits of the inhabitants of the metropolis. For the present purpose, however, they seemed to have become narrow-minded in the interests of their clients, the consumers, who were always characterized by that failing. But denying, as he did, that it would have been economical to erect their new works piecemeal, he denied also that the scale upon which the company had erected their works would be productive of a larger working expenditure. However, these were all matters of detail, and the company would be able to satisfy the commission that what they had done was the right thing. No doubt a great deal of money had been expended which at present was unproductive, but it might just as well exist in the works as in the coffers of the company, inasmuch as it was capital raised, and therefore entitled to dividend. The preamble to the company's Act recognized the absolute necessity for the erection of additional works—works of a very costly character, inasmuch as they involved the purchase of land at a great distance from their area of supply, and the laying down of mains to connect the several parts of their existing works with the new system. Parliament in the most explicit manner assented to this in 1869, and yet in 1874 the Metropolitan Board assumed on behalf of the consumers to question the discretion of the company in carrying out, so far as they had done, the intention of the Legislature, and which in the preamble of the Act of 1869 it was stated to be imperatively necessary for the company to undertake. The commissioners would find by the evidence that the company had not, as alleged, indulged in extravagant expenditure upon their new works, but had simply provided there the manufacturing capacity which in the normal state of their business they believed would be their requirements for the next ten years. He would ask the commissioners to determine whether, at the instance of the Metropolitan Board, they were prepared to sit in judgment upon the conduct of the directors in doing that which the Act of Parliament gave them power to do, without limitation, at their discretion, which discretion had been exercised with due care and management. If, indeed, this complaint of the Metropolitan Board was the only one to make, he doubted whether the commissioners could entertain it without appearing to sit in judgment on the wisdom of Parliament, a position which he imagined they would not be desirous of assuming. He did not suppose they would shut out the inquiry, nor did he make the suggestion with a view to tempt them to do so. Indeed, the company, by their answer to the 16th interrogatory of the board, had been carefully exhaustive in their endeavour to furnish the most detailed information with respect to their new works, so that the board should be left without the chance of saying that they had paid too much for the land, or too much for brick or stone, or that the number of retorts, instead of being 260, might have been 270 or 250. How could the commissioners exercise a judicial discretion in a matter like this, and say whether, at the present moment, 260 retorts was a proof of due care and management, and 270 was not? Who could be better judges of the requirements of their business than the directors themselves, and what difference could it possibly make to them whether, with the amount of capital which Parliament had placed at their disposal—and which, from the time the Act was passed, might have been called up and be entitled to dividend—they called it up and did not spend it, or called it up and did spend it. The fact of calling it up, was a thing sanctioned by Parliament; the expenditure was a thing sanctioned by Parliament, but the mode of expenditure was left to their discretion. He did not mean to say that if there was a decided blot, and they found at the new works a number of retorts which could not possibly be wanted for the next 20 years, they would not be entitled to have an opinion about it. But on this point the company challenged inquiry whether there had been one shilling unadvisedly or improperly expended; they only asked the commission to bear in mind the statutory obligations under which they were placed, and the penalties to which they would be exposed if they did not make provision for giving an adequate supply of gas to the public. Technically, the present application was for a revision of the scale of illuminating power.

Mr. CRIPPS: That does not arise.

Serjeant SARGOOD said the commission were not asked to interfere with the illuminating power, and therefore he would say nothing about that.

Mr. *John Field*, examined by Mr. BIDDER.

I am the accountant of the Imperial Gaslight Company, and have acted in that capacity for some years past. I am responsible for the statements of accounts which have been furnished in answer to the inquiries made by the Metropolitan Board. They were prepared, under my superintendence and instructions, from the books of the company. The first sheet shows the total amount of capital raised; and the second, the capital raised since the passing of the Act of 1869, and how and where expended. The balance of capital account at the end of last year was £307,511, a portion of which will go to meet the works now being executed, and the remainder become trade capital. The sum of £1197 represents premiums on the sale of unallotted shares, which were carried to the credit of profit and loss by order of the directors, thus giving the consumers the direct benefit of that amount. The balance of premiums received—£1797—was carried to capital account by direction of the official auditors. Sheet No. 3 shows that, in order to make up the statutory dividends for the last half year the company were obliged to resort to their reserve-fund to the extent of £41,647, leaving the amount now standing to the credit of that fund £27,065. The necessity for taking this £41,647 is arrived at thus: Dividends for the half year ending Dec. 31 on £1,560,000 stock, at 5 per cent. for the half year, £78,000; on £845,000 of £12 10s. shares, 3½ per cent. for six months, £29,575; on £65,000, at the same rate for five months, £1896; on £65,000, at the same rate for three months, £1137; and on £120,165 from the 22nd of December, £201; total, £110,809. The profit for the half year, as shown by the audited accounts, was £69,162, leaving a deficiency of £41,647. That is the sum we propose to withdraw from the reserve-fund. The following sheets set out the contracts for coals, coke, and residual products, which are correct extracts from the books. It is not within my province to state the circumstances under which they were made. Sheet 10 answers the question as to the amount of gas consumed under the heads of "Public lighting and other contracts." The gas supplied to the public lamps is taken at so much per lamp; we contract to give a given quantity per burner, and that multiplied by the number of hours in the year in which they are lighted, gives the consumption. It is an estimated and not a measured result. Sheet 11 is an estimate of the income for the year 1874, from the sale of gas and residual products, based upon the year 1873, adding an increase of 1½ per cent. In the year 1870 the increase was 4.58 per cent. upon the income of 1869. The increase of 1871 was 9·07 upon that of 1870. The increase of 1872 was 1·44 on that of 1871, and 1873 was an increase of 6·21 on that of 1872. I have taken a less rate of increase for 1874 because I thought in all probability we should require a large increase in the price of gas, and that, I am certain, would considerably diminish the consumption. I have inquired of the Chartered Company, and found that after the revision of their rise in price they obtained an increase of only 1½ per cent. I have estimated the quantity of coal required to be consumed on the same estimated sale of gas, and the income of the company on the maximum price, 3s. 9d. per 1000. The sum of £14,913, for "lighting and repairing public lamps," is the amount which the parishes pay the company for that service. It represents within £100 the actual cost of the work to the company. The estimated produce of coke and breeze is £185,443, which is arrived at in this way. The quantity of gas I estimate will be sold, divided by 8600, which is the estimated number of feet per ton, gives me 416,163 tons as the quantity required to make the gas, and I reckon that each ton of coal will produce a chaldron or 36 bushels of coke. I deduct 24½ per cent. of the coke for fuel, which leaves 302,759 chaldrons for sale. I take an estimate of the four years, 1869 to 1872, to ascertain the price which will be received. This shows that the price received per ton of coal was an average of 7s. 7·6d. The coals for those four years average 16s. 2·8d., so that the sale of coke was equal to 47 per cent. of the cost of the coal. We shall have to sell our coke at 15s. a chaldron. The estimate for tar, £27,290, is based upon our existing contract, which extends to March, 1865, to sell at 1¾d. per gallon. The quantity assumed is nine gallons per ton. For ammoniacal liquor I estimate £17,600, which works out 6s. 1d. per butt. That contract runs out in March, and we may get better terms. The other items of rents receivable and transfer fees are taken from last year, £1780. The next sheet gives the estimated expenditure for 1874. The first and principal item is coals, which I take at £542,757.

Mr. BIDDER: What is the quantity of that which is estimated?

Witness: I have taken the value of coal in stock on Jan. 1, as appears by the audited accounts, £53,782. I have then taken the coal contracted for, to be delivered this year at the contract price of £260,077. We shall then have to purchase 17,266 tons of Newcastle coal, which is estimated to cost 21s. 8d., and 12,544 tons at 42s., making £211,880. That divided by the total quantity —the total estimate of consumption during the year—works out an average of 26s. 1d. per ton. The quantity estimated for is 183,810 tons. To this must be added £17,392 as the cost of the delivery of the Newcastle coal; and that, with £390 in excess on iron, is all that is estimated, making £103,810 out of the total of £542,757. On the item of "Purifying materials"—£22,369—I have taken an increase of ½d. per 1000 feet in consequence of the requirements of the referees, the particulars of which the engineer will supply. Salaries—£5327—are the actual salaries on Jan. 1; wages (manufacturing), £67,106. I have taken an increase of ·7d. per 1000, which I was instructed to allow in consequence of the extra charge on labour for purifying. Repairs and maintenance, £74,562, is less than the actual cost in 1873. The average of the last five years is 5·36d. per 1000; and although labour and material is rather higher, I hope that by bringing in the Bromley works we shall not have so much to do at other places. I have, therefore, reduced ¼d. per 1000 upon the year 1873. The "Salaries and wages of officers connected with distribution," £14,700, are taken as the amount fixed by the directors as the actual salaries of the year. "Repairs, maintenance, renewals of mains and services, including materials, paving, and labour," I have estimated on the average of the last six years. "Meters, repairs and renewals," £11,333, are taken on the same estimate as the previous years. "Public lamps, lighting and repairing," £14,913." This item is almost identical with the income from this source every year. Sometimes we lose and sometimes we gain £50 or £60 perhaps. "Rents, rates, and taxes, £3280"—rates are a' little higher, and by making gas at Bromley those works will become rateable this year. As to "Management expenses," the "Directors allowances, £4000," those are fixed, and the "Auditors, £210." The "Salaries, £6077," are rather less, owing to a transfer of a part of the clerks salaries to distribution account; "Collectors commission, £9725," is the amount fixed for this year: "Stationery and printing, £3280;" and "General charges and incidentals, £2982." I have taken them on the same basis. "Law and parliamentary charges, £746," are somewhat less than last year, but I do not know what they will be. There is a little increase in the item "Bad debts, £4474." Last year it was exceptionally low. "Gas referees, official auditor, and public testing offices, £1342," is a charge we have no control over, it is fixed by the Board of Trade. (Total estimated expenditure for the year, £813,042.) The two next sheets contain the details of the items "Salaries" and "Wages," which are taken from the books and work-sheets. I suppose our rate of wages is the same as other companies, but the engineer will be better able to answer that question. Sheet 15 answers the question as to the

"Pensions;" 16, the gas sold for the years 1869 to 1873;" and 17, particulars of the works at Bromley, which are extracted from the books of the company.

Cross-examined by Mr. CRIPPS: As the accountant to the Imperial Gas Company, I have devoted a considerable amount of time to analyzing their accounts and those of other companies for some years past, and have published analyses of those accounts for the years 1869 to 1872 inclusive. The analysis for 1873 is not published yet. In the year 1870 the Imperial Company charged 3s. 9d., and paid 10 per cent., carrying a small sum to the reserve-fund. In 1869 the net cost of coal was 14·56d. per 1000 cubic feet of gas; in 1870 it was 13·23d.; and in 1872 it was 12·56d.; the difference being about ¾d. less. The increase, however, between 1870 and 1873 in the cost of coal is 2·66d.; as between 1869 and 1873 the increase is only 1·33d. The proper way to estimate the net price of coal is to take its price in any year as against the price of the residual products in that year. The year 1873 was an exceptional year for the price of coke. We got what had not been obtained in any previous year, 27s., 28s., and 30s. per chaldron; coals being dear consequent upon the panic in the market and a strike in the North.

Mr. CRIPPS: The real question which affects the price of gas, as between the consumer and the company, is the net cost of coal?

Witness: It is.

Serjeant SARGOOD: Surely that is not an accountant's question?

The CHAIRMAN: The witness, at all events, does not object to answer the question.

Mr. CRIPPS (to witness): Now the price of coal we will depart from. What are the other matters which arise in the cost of gas per 1000 feet extra the increased price of coal, for which we have 1·33d.?

Witness: Taking the last year, 1873, which you have before you, there is an increase in the purifying, which will be still further increased in 1874. Salaries are the same, but there is an increase in wages. The difference in wages between the years 1870 and 1873 is ·84d.

Mr. CRIPPS: Can you give me, apart from the question of capital and the interest required to make up the dividend upon capital, what is the entire increase in the cost of making gas per 1000 between the two periods, 1869 and 1873?

Witness: 2·83d.

Serjeant SARGOOD: Does that mean "total expenditure apart from dividend? Your word "manufacture" will not include that.

Mr. CRIPPS: Mr. Field's own book shows all the various expenses under different heads. You can strike out from those the amount due to the company for interest on capital, and then tell me what the increased cost of manufacturing and distributing was per 1000 cubic feet, between 1869 and 1873?

Witness: 2·83d. That is according to the actual working of the company.

Mr. CRIPPS: If there were no question here, to put it in other words, about capital and interest on capital, any increased price which the consumer would have to pay would be satisfied by 2·83d.

Witness: Provided we have an equal return from the gas-rentals.

Mr. CRIPPS: He would get the same article supplied to him at that increased price?

Witness: Yes.

Mr. CRIPPS: Any difference that you want the consumer to pay must be a difference going into the pockets of the shareholders, as interest upon their capital, or into the reserve-fund?

Witness: I do not see that.

Cross-examination continued: I am aware that the company have given notice to terminate their public lighting contracts. Assuming those contracts terminated, and the public lamps supplied at the same price as private consumers, it would give the company about ½d. per 1000. Deducting that from the 2·83d. increased expense of manufacture, would make the extra cost to the company 2·33d. The total amount of capital raised since the Act of 1869 is £1,015,400, of which £182,131 was raised at 10 per cent., and £833,270 at 7 per cent. To pay the statutory dividends on these amounts requires £76,541. In 1870 we required 1s. 1·73d. per 1000 cubic feet to pay our dividend; in 1873 it was 1s. 2·83d., being a difference of 1 1/10d.; the amount required in 1874 will be 1s. 3·6d.

Mr. PHILBRICK: The difference is as near 1d. as may be. The difference in the dividends is £14,701, and 1d. in the make of gas is £14,600, therefore it must be very near 1d.

Cross-examination continued: A portion of the capital was raised on the 22nd of December last. That has all been expended. After we pay our wages to-morrow we shall have £219 at the bankers. The money called up has gone into the company's general account at the bankers, and they disburse it as required. The balance at the bankers on Dec. 31 was £67,784. The money called up last December forms part of our floating capital. It is impossible for us to carry on our manufacture without a certain amount of floating capital, and at this period of the year we require a large amount, and still more so now, because of the price of coal and other materials. The public will have to pay 7 per cent. upon it. I cannot give the information about the places at which these amounts, £244,735 and £770,665, raised by shares since 1869, have been applied to capital purposes. The capital raised goes into the general finances of the company, and is disbursed as required. The ledger shows the capital account. In the years 1871 to 1873 there was raised on debentures £168,650, and there were debentures paid off £156,500, bringing out £12,150. There would be an increased payment of interest on the capital raised to pay off debentures. We should take off against the £76,541 the saving effected by paying off the £156,500 of debentures. The difference of interest between the shares raised at 7 per cent. and the debentures paid off at 5 per cent. would be a charge against the public. The increase required for dividend on the larger amount of capital in 1873, as compared with 1870, is 4·2d. per 1000. The dividend for 1874 I have worked out, and find it to be 15·6d.

Re-examined by Mr. BIDDER: The price of gas to the consumers generally was raised from 3s. 8d. to 3s. 9d. in 1872, and the new arrangements for the public lamps came into operation in July last. The net price realized for gas in 1873 was 3s. 8·50d. per 1000 feet. The estimate for 1874 is at the rate of 3s. 9d. The increase of cost in 1874 as against 1873 is 2·75d. I assume there will be a decrease in the income of 1874 on that of 1873 of 2·16d. per 1000, making with the estimated increase of cost a difference of 4·9d. per 1000. I calculate that the coals will cost more, and the coke will realize less, than in 1873. In 1873 our coals to a considerable extent were purchased under contracts made before the great rise in price, while we were realizing our coke at the high rates prevailing during the year. Our coal in 1874 will chiefly be supplied under contracts made during the dearest time; on the other hand, the fall which has taken place in the price of coke will affect the returns we shall obtain for that article. The interest on our debentures in 1870 amounted to 1·78d. per 1000 cubic feet of gas, and in 1873 it cost us 1·66d. The dividend required to be paid in 1874 will be equal to 15·6d. per 1000, instead of 13·73d., which was the rate per 1000 in 1870. In order to reduce the rate in 1874 to the rate of 1870, it would require that our gas sales should be increased about 14 per cent.

By the COMMISSIONERS: Our books show the amount of capital expended at each of the stations.

Mr. PATTISON: I want to know the amount of gas produced at each station, and the amount of capital expended at each, so as to make a comparison. It would be convenient to have it in a tabular form.

Serjeant SARGOOD: You shall have it.

Mr. PATTISON (to witness): You have given us the floating capital of your company. Being familiar with the accounts of other companies, can you give the total capital each of them requires to carry on their business?

Mr. CRIPPS: You will find it in the red book (Mr. Field's analyses).

Mr. PATTISON: Can you explain the great fluctuations in the rate of increase in the consumption of gas by your company from year to year? I ask it because you have assumed an increase of 1½ per cent. for 1874.

Witness: I cannot. The increase in the consumption of gas is very uncertain.

Mr. PATTISON: I observe you only give an increase of 1½ per cent. for 1874?

Witness: The reason for that is, that the increased price will check the demand; the consumers will be more economical in their burning, and they will try to save the increase of price, which the commissioners may give us, by reducing the quantity consumed.

The CHAIRMAN: I want to ask with reference to the disposition of the money received from the sale of new shares. What ultimately became of that sum of £1197 12s. which is stated in your answer to have been carried to the credit of the profit and loss account?

Witness: It found its way into the reserve-fund. As the reserve-fund becomes full we are compelled, under the Act, to reduce the price of gas, and the consumer has the benefit of it.

The CHAIRMAN: The official auditor called your attention to that which we considered an irregularity in the original application of that money. Did he require you to correct that application?

Witness: Not the back one. He said, "I will pass that; there is not much difference in it, but I prefer that it should be written off capital account."

The CHAIRMAN: Do any of the returns you have made show the rate of interest paid on your existing debentures?

Witness: No; I will supply it. We have £6300 at 4 per cent., £92,000 at 4½ per cent., 188,300 at 4½ per cent., and £150 at 5 per cent. The whole average is 4·41 per cent.

The CHAIRMAN: Are the bonds still outstanding bearing 10 per cent. interest?

Witness: Yes. Those bonds, amounting to £130,000, represent profits not divided among the shareholders in olden times, when they received 23 and 24 per cent. These profits were allowed to accumulate, and Parliament allowed the company to capitalize £280,000, but did not allow them to pay more than 4¾ per cent.

The CHAIRMAN: Then that is a redeemable debt?

Witness: As far as the company are concerned it is redeemable.

Dr. ODLING: In page 16 of your book there is an item for your company of 16·68d. per 1000 feet under the heading of "Total working expenses." Am I to understand that that includes the expense of manufacturing charges and distribution?

Witness: It does.

Dr. ODLING: Bad debts and everything, in fact?

Witness: Yes, everything.

Dr. ODLING: In the next column there is the figure 29·83. Does that mean that if your company received 29·83d. per 1000 cubic feet it would pay all their expenses, and leave nothing for dividend or interest on loan capital?

Witness: It would.

Dr. ODLING: The gas that you sold in 1873 amounted to 3,526,215,000 cubic feet, and I think you said that the excess required to pay dividend in 1873 above that required to pay dividend in 1869 was £71,000 or £76,000?

Mr. CRIPPS: £76,500 between the years 1870 and 1873.

Dr. ODLING: Will you tell me how much £76,500 would be per 1000 cubic feet distributed over 3,526,215,000 cubic feet?

Witness: 5·2d.

Dr. ODLING: The gross amount paid for coals is 1873 was £499,529. Suppose the price of coal in 1874 to be the same as in 1873, would you add on 1½ per cent. to that for the increased sale of gas?

Witness: We should. But there is one thing. Our sale of gas in 1873 averaged only 8500 feet per ton, and I have assumed that in 1874 our engineer would work a little better, and I have taken the yield of gas at 8600 feet per ton.

Dr. ODLING: Your estimate for the cost in 1874 is £542,757.

Witness: Yes.

The following coal estimate was handed in:—

Coal Estimate.

An estimate of the quantity of gas to be sold in the year 1874, and of the quantity and cost of the coals to be carbonized for the same period:—

The quantity of gas sold in the year 1873 was	3,526,215,000	cubic feet.
Add for increase in business in 1874, estimated at 1½ per ct.	52,893,000	,,
	3,579,108,000	,,
Quantity of gas estimated to be sold in the year 1874, say.	3,579,000,000	,,

It is estimated that the quantity of gas sold will average 8600 feet per ton of coals carbonized, therefore 416,163 tons of coals will be required to provide for the supply of the above quantity of 3,579,000,000 cubic feet.

	Newcastle. Tons. (94 per cent.)	Cannel. Tons. (6 per cent.)	Total. Tons.
Coals required.	391,193 ..	24,970 ..	416,163
Stock in hand Jan. 1, 1874 . . .	33,556 ..	4,622 ..	38,178
	357,637 ..	20,348 ..	377,985
Undelivered under contracts made prior to Jan. 1, 1874	186,371 ..	7,804 ..	194,175
To purchase	171,266 ..	12,544 ..	183,810

Cost of Coals.

On hand—				
Newcastle . . .	33,556 tons	at 25s. 11d. per ton	£45,483	
Cannel	4,252 ,,	41s. 7d. ,,	8,841	
Boghead	370 ,,	78s. 10d. ,,	1,458	
	38,178 tons.			£53,782
Contracted for—				
Newcastle . . .	186,371 tons	at 26s. 2d. per ton	£243,835	
Cannel	5,853 ,,	41s. 6d. ,,	12,145	
Ditto	1,951 ,,	42s. 0d. ,,	4,097	
	194,175 tons.			260,077
To purchase—				
Newcastle . . .	171,266 tons	at 21s. 8d. per ton	£185,538	
Cannel	12,544 ,,	42s. 0d. ,,	26,342	
	183,810 tons.			211,880
				£525,739
Lighterage and canal dues on 357,637 tons of Newcastle coals at 11·7d. per ton				17,392
Estimated cost of coals (including lighterage and canal dues) for the year 1874				£543,131
				542,757
				£374

The above sum of £543,131 exceeds the estimate by £374. The excess arises from a short estimate of the additional cost of landing coal at Bromley previous to the completion of the coal-lift about April next.

£542,757 ÷ 416,163 = £1 6s. 1d.

Station.	Lighterage.	Coal Dues.	Wages.	Total.	Coals to Carbonize.	Less Stock in Hand.	To be Delivered.	TotatAmt. Paid for Lightage	Average per Ton.
	Pr. Ton. d.	P. Ton d.	Pr. Ton. d.	P. Ton. d.	Tons.	Tons.	Tons.	£	d.
P.	..	..	1⅞	1⅞	92,120	4,771	87,349	637	..
S.	6	10	5½	21½	92,120	8,108	84,012	7,526	..
F.	6	1	5½	12½	137,240	18,740	118,500	5,950	..
B.	3	..	5½	8½	69,713	1,937	67,776	2,400	..
					391,193	33,556	357,637	16,513	..
Add to Bromley for additional charge for landing coals without lift .								879	..
								17,392	11·7

Dr. ODLING: You do not sell any coke by contract?

Witness: We do.

Dr. ODLING: Will you tell me how you have estimated the price that you will realize for your coke during the year 1874?

Witness: I had better give you a table of that.

The following coke estimate was handed in:—

Coke Estimate.

An estimate of the quantity of coke that will be sold in the year 1874, and of the price that will be received for it:—

The quantity of coals required for the year 1874 is estimated at 416,163 tons; and as each ton of coal is estimated to produce 1 chaldron of coke (of 36 bushels), the quantity of coke produced will be . . . . . 416,163 chaldrons.

*Of this quantity there will be required for fuel 27¼ per cent. = 113,404 ,,

Leaving for sale . . . . . 302,759 chaldrons.

The estimate of the price that will be realized per chaldron has been based upon the results of the four years 1869, 1870, 1871, and 1872, which show that the average price received for a chaldron of coke is 47 per cent. of the price paid for a ton of coal.

* The estimate of the proportion required for fuel is based upon the quantity so used in the four years 1869, 1870, 1871, and 1872.

Year.	Coke Made. Chaldrons.	Coke Sold. Chaldrons.	Coke Used for Fuel. Chaldrons.
1869	336,802	235,777	101,025
1870	370,074	267,930	102,144
1871	378,331	283,212	95,119
1872	385,638	283,394	102,244
	1,470,845	1,070,313	400,532

Being 27¼ per cent. upon the quantity made.

Year.	Coals.		Coke.	
	Tons. Carbonized.	Amount Paid.	Chaldrons Sold.	Amount Received.
1869	330,689	£267,141	235,777	£80,048
1870	354,292	281,362	267,930	99,707
1871	373,040	295,419	283,212	96,817
1872	385,639	331,817	283,394	131,918
	1,448,660	1,175,739 Averaging 16s. 2·8d. per ton.	1,070,313	408,490 Averaging 7s. 7·6d. per chaldron, and being 47 per cent. of the cost per ton of coal.

And applying this principle to the cost of coal for 1874, which has been estimated at 26s. 1d. per ton (see coal estimate) the price that will be realized for coke works out at 12s. 3d. per chaldron.

Therefore, it is estimated that in the year 1874 the company will sell 302,759 chaldrons of coke at 12s. 3d. per chaldron, amounting to a sum of £185,443. (The exact figures are £185,440.)

To enable the company to realize the price of 12s. 3d. per chaldron of 36 bushels, they will have to sell the chaldron of 42 bushels at 14s. 11¼d. } 12s. 3d. 2s. 0¼d. plus ⅓th. 8d. labour, loading, &c.

Dr. ODLING: What is the contract for tar?

Witness: 1¾d. per gallon. The contract was made on April 12, 1872.

Serjeant SARGOOD: Our replies to interrogatories show, on page 7, all the existing contracts. There is one thing Mr. Field will tell you, if you will ask him, as I am not entitled to do it—Taking our working expenses as a whole, what decimal they will come out to, and what they were as compared with other companies?

Dr. ODLING: Give us a comparison of working expenses per 1000 feet of gas made by your company as compared with other companies?

Witness handed in the following table:—

Working Expenses—Per Ton and per 1000 Sold.

Company.	Total for Four Years, 1869—1872.					
	Coals Carbonized.	Gas Sold.	Amount.	Per Ton.	Per 1000	
	Tons.	Cubic Feet.	£	s. d.	d.	
Independent . . .	218,078	1,833,491,000	128,177	11 9·06	16·78	
Commercial . . .	338,489	2,821,187,000	190,312	11 2·93	16·19	
Ratcliff	76,768	646,981,000	55,890	14 6·73	20·73	
Equitable	94,290	846,587,000	49,709	10 6·53	14·09	For 1869 and 1870.
London	404,290	3,446,559,000	254,332	12 6·98	17·71	
Phœnix	490,701	4,149,279,000	278,463	11 4·19	16·10	
S. Metropolitan . .	259,767	2,324,264,000	150,654	11 7·27	15·56	
Surrey Consumers .	176,956	1,355,697,000	93,131	12 6·31	16·49	
Western	180,724	1,555,083,000	109,463	12 1·37	16·89	For 1869-70-71.
	2,240,063	18,979,128,000	1,310,131	11 8·37	16·57	
Gaslight	1,404,661	11,264,008,000	741,317	10 6·66	15·80	
Total	3,644,724	30,243,136,000	2,051,448	11 3·08	16·28	
Imperial	1,448,660	12,461,599,000	779,895	10 9·21	15·02	

Mr. CRIPPS: Will you at the same time supply us with what the capital employed by these companies is per 1000 feet? Unless we have the whole, it is nothing.

The CHAIRMAN: You can furnish that to-morrow.

Mr. *Thomas Nesham Kirkham*, examined by Serjeant SARGOOD.

I am engineer-in-chief of the Imperial Gas Company, with whom I have been engaged for the last 30 years, and have had a very extended experience and opportunity of gaining knowledge of the nature of their works, and what is essential in order to carry on their trade. For some years prior to 1869 we had been very much pressed for want of sufficient works to manufacture the gas required—St. Pancras, Shoreditch, and Fulham being our only stations. These we increased as far as the land would allow; in fact, the first two, to an extent that became inconvenient and obstructive. We then obtained parliamentary sanction to erect works at Bromley, and have purchased there 150 acres of land, which is sufficient for a make of something like 30 million cubic feet per day. Our maximum in 1873 was just under 20 millions. Our normal rate of increase may reasonably be anticipated as from 7 to 8 per cent., if not disturbed by the cost and difficulty of obtaining coal, or outside influences, so that it will probably be from 14 to 15 years before the whole of the Bromley works are brought into operation. I consider it was prudent on the part of the directors to aim at providing at once for the ultimate consumption of gas, rather than going in for smaller works, and having to pay a fancy price to eke the land out afterwards. [A plan of the works was produced.] We have commenced operations there by building a bridge—an approach from Bromley to the West Ham Marshes—over the river Lea and Bow Creek. The necessity for it was laid before, and ultimately sanctioned by, Parliament in our Act of 1869—it being the only means of communication between the new works and London. There are two retort-houses, with coal stores, railway lift, and so forth, partly finished, the whole of the retorts in one house completed. The total amount expended to Dec. 31, 1873, was £124,440. Each house contains 200 retorts, intended to carbonize 260 tons of coal in two shifts, making 520 tons per day. We commenced making gas there on the 15th of December last, being compelled to begin, whether we would or not, on account of the room which we wanted for purification. We have had occasion to use the whole of these retorts prior to to-day. There are at present only two exhausters and engine, and one set of pumps, the building for which is not entirely finished. Of the whole area capable of making 30 millions, there is only laid out sufficient for 20 millions, and, as far as the works have at present progressed, for 12½ millions. We have also made, in accordance with our Act of 1869, a dock for unloading our coals and loading barges with coke, tar, liquor, and other things. This is now completed, and will be capable of accommodating all that we want up to the extent of 30 millions. It could not very well have been made in sections. If it had to be commenced now, it would cost 50 per cent. more than it did in 1870, on account of the changes and rise in prices. Then there are the wharves in front of Bow Creek, which we were compelled by the Thames Conservancy to erect, so as to protect the piers of the bridge. There is also a retaining wall, which we were obliged to form to save the land. Having regard to what we were capable of doing at our other stations, it is a fact that at the time we began the new works they were imperatively called for, by our inability to manufacture sufficient gas elsewhere. With regard to the purification question, I may state that by the Metropolis Gas Act of 1860 the sulphur maximum was fixed at 20 grains, tested by Dr. Letheby's apparatus. Since then the referees have employed a more severe test, which limits us to 15 grains, to arrive at which maximum we are bound to use lime instead of oxide of iron; in fact, going back to the system of purification that existed 20 or 25 years ago. By this change we require something like 70 per cent. more area for the purification than we did by the oxide of iron process, and this is one of the things that compelled our getting to work at Bromley without waiting for the further progress of the building. With regard to the number of grains of sulphur, the referees have extended some indulgence to us, on account of the difficulty we have encountered in making this change. On the 30th of June, 1873, they issued the following notice:—"The gas referees have to make the following announcement as to the 'sulphur maximum':—For gas made at Beckton and Bow the maximum shall remain fixed at 20 grains, but the referees have determined, in consideration of various difficulties which the gas companies have encountered in attempting to reduce the amount of sulphur below 20 grains at works less favourably situated, to allow at these works, from this date until Sept. 30, a maximum of 25 grains. During the winter half year it is the intention of the referees, in further consideration of the increased quantity of gas which the companies have to make, to raise the maximum to 30 grains. But the referees wish it to be understood that they sanction these maxima for the periods named only because it appears that at several gas-works the purifying apparatus is on an insufficient scale, and in the hope that the time thus granted will be used by the companies in making such additions and improvements as will secure to the public a higher standard of purity for the future." This is signed by Mr. Vernon Harcourt and Dr. William Pole. By March next the works will be completed so as to send out the gas with a maximum of 20 grains of sulphur, but this will involve us in increased expense to the extent of 9d. per ton of coal; or, in round numbers, about 1d. per 1000 feet of gas, in addition to the ½d. it originally cost. In laying out a place of this description there is an enormous amount of capital expended, and in progress of being expended, which cannot be immediately productive, so that it is not at all out of the usual course of commercial events that this company has been, since 1869, compelled to raise and lay out a very large amount of capital, in order to meet the future demands for gas, which at the present moment is unproductive. Another very heavy capital expense consists in mains. We shall require a 48-inch main to carry the gas from West Ham to the places where it is disposed of to the public. This is a distance of over five miles. A 24-inch main would not have answered our purpose even now, and it would not have been a prudent thing to lay down a main for a length of five miles, that was only capable of accommodating the consumers now using it, but would not be sufficient for our wants four or five years hence, and would have to be supplemented by a second. We purpose erecting station-meters at Bromley; we have no room for them at our other stations. These are for measuring the quantity of gas made; they have nothing to do with the quantity of gas sold, or any way disposed of, this being ascertained by the consumers meters, and by meters fixed at the works. With regard to the gas used by the examiners, we are anxious to avoid meddling with it as it comes from the works, and before it comes into the hands of those who test it. We do not want to intervene by meterage if we can avoid it.

Serjeant SARGOOD: When a distinction is drawn between the cost of making gas and the necessity of making dividend, that which makes the dividend is the capital expenditure which is necessary to make the gas. What is called making gas, must be constituted of a sufficient plant, and the materials out of which it is made?

Witness: Yes.

Serjeant SARGOOD: Whether you pay for one out of income, or the other out of capital at all, it is the cost, actual and prospective, necessary to make gas?

Witness: Yes.

Serjeant SARGOOD: Are you aware of any outlay of capital at Bromley, which is not needed for the purpose of making the gas you want to-day, or the gas which, in all reasonable possibility, you will want in future?

Witness: No.

CHATHAM AND ROCHESTER GAS COMPANY.—The half-yearly meeting was held on the 12th inst.—Mr. J. Whittle presiding. The annual statement of accounts was read by the secretary, Mr. Lyons, when the maximum dividend at the rate of 10 per cent. per annum on the old shares, and 7 per cent. on the new, was declared for the past half year. It was announced that notwithstanding the great rise on the price of coal, no advance would be made in the charges for gas. At the close of the meeting the directors, with the shareholders and a number of gentlemen, dined together at the Crown Hotel, Rochester Bridge.

EUROPEAN GAS COMPANY, LIMITED.

The Half-Yearly Extraordinary Meeting of the Shareholders of this Company was held at the Offices, No. 11, Austin Friars, London, on Wednesday, Feb. 18—W. WHITE, Esq., in the chair.

The SECRETARY (Mr. H. M'L. Backler) read the advertisement convening the meeting, and the following report of the directors:—

Your directors are not able, at this period of the financial year, to report with certainty on the accounts, which, as you are aware, cannot be accurately rendered until after the usual stock-taking on the 31st of March.

No event of special importance to the company having occurred since the last annual meeting, the managers of the stations have been free to devote their whole attention to the different works under their charge. This was particularly required at Nantes, where a new retort-house had to be constructed, with a view to prevent the extinguishing of the fires from inundations, as was the case in December, 1872.

At Caen, Havre, Rouen, and Amiens, the extensions already announced to you as necessary are being carried into effect, and will shortly be completed.

The outlay for this purpose, and to provide for instalments due on purchases of land and property made from time to time, as favourable opportunites occurred, is considerable, and the working capital, as stated in the last report, continues much in excess of previous requirements, owing principally to the advanced prices of coals and materials, and also to the necessity of keeping larger stocks than were needed formerly.

Your directors are pleased to report that, by availing themselves of contracts, providently made before the great rise in the price of coals, and with a judicious use of additional capital, they have maintained the profits which would otherwise have been materially reduced.

It is satisfactory to state that purchases of coals may now be effected on terms much lower than for many months past, and that the tendency is evidently towards a further decline.

Coke has not yet fallen in value in the same proportion, but this will probably be the case in course of time.

The prospect of returns from residual products is eminently satisfactory.

A demand for capital, so unusually large as that already mentioned, has tried the ways and means of the company to the utmost. The sum of £2 10s. per share, uncalled on the new shares issued in 1862, has been forestalled by loans, and the powers of the directors to raise further funds must now be increased. The adoption of some plan, by which available capital may be placed at the disposal of the board, is therefore indispensable.

A scheme combining that object, with an appropriation of past profits, accumulated during the period when the renewal of the concessions, now settled by treaties for long terms of years at all the stations, was still pending, and which reserve was temporarily invested in the undertaking, will be submitted to the shareholders, at an extraordinary general meeting to be held this day for that special purpose.

A warrant for the usual interim dividend, at the rate of 8 per cent. per annum, was forwarded to every shareholder on the 31st of January.

The CHAIRMAN: Gentlemen, you have heard the report read. It states that the company have not, to any serious extent, been affected by the events of the last seven months since we held our annual meeting. You can, therefore, readily understand that I have very little to add to the information given to you in the report. As regards the contemplated increase of capital, I reserve any remarks I may have to make on that subject for the special meeting, which is summoned to take place this afternoon. My duty now is entirely limited to moving the adoption of the report on the general affairs of the company. All the stations, I am happy to say, are in good order, and the outlay made upon them has, in my opinion, added the full equivalent of value in every respect. We have occasionally difficulties to meet and surmount in the several localities in which our operations are carried on, but, taken as a whole, I think that no company get on better than we do. I am happy to say that we have partially escaped the very high price of coals, which high price has long prevailed. We have, however, been assisted by the favourable contracts to which the report alludes, and I am gratified in being able to inform you that those contracts have not yet expired. We are able now to lay in our supply of English coal at a reduction of from 35 to 40 per cent. on the price which we should have had to pay this time last year, and we are now confidently looking for a considerably larger reduction. The price of coke hitherto has been fully maintained, but will, I think, of necessity, fall in the course of time. I am disposed, however, to believe that having come into more general use as a substitute for coal in the last two years, it will not diminish in price very considerably. When we found that English coal could be obtained again, we disposed of a large quantity of French coal, which is not quite so good for carbonizing purposes, and, being ably assisted by the managers at several of the stations, we thus secured considerable advantages to the company, so that we hope, when we make up our accounts, to compensate to a large extent the disadvantages under which we have been labouring. Notwithstanding the uncertainty which so long prevailed in France, and the paralyzing effects on trade of a want of confidence, our rental is very satisfactory. When we have again to supply the large industrial establishments, we shall most likely find that the great improvements we have made will repay us with still further benefits for the large expenditure of our capital. I now move—"That the report be received and adopted."

Mr. FAWCETT seconded the motion, which was put and carried unanimously.

This concluded the business of the ordinary meeting.

A special meeting was then held for the purpose of authorizing an increase in the capital of the company. The formal notice of such meeting having been taken as read,

The CHAIRMAN said: Gentlemen, I have a few observations to make to you upon the subject of the proposed increase of capital; but we took care, in drawing the notice calling this very important meeting, that it should state with unusual fulness the object we had in view, so that every shareholder, whether attending here or not, should be able perfectly to understand the business which has to be brought forward. The reports of the directors have acquainted you from time to time with the works in progress, and also those in contemplation, the purchase of land and property, the main-laying, and the various accessories involving a very great outlay of the capital of the company; in addition to which, the working capital has greatly increased owing to the extending scale in which the operations of the company are year by year carried on, and the absolute necessity, in common prudence, of keeping large stocks at all our stations, and which it would have been culpably negligent on our part to refrain from doing, after our experience during the late war and the subsequent state of the coal trade. The state of the coal trade rendered the supplies both difficult and costly—to such a degree, indeed, that our concessions might have been imperilled if we had not bestirred ourselves very much, and taken care that your interests did not suffer in our hands. It is, therefore, highly important that we should be always amply provided in future, and we intend to act accordingly. Our last issue of capital took place in 1862, and I will quote a few figures to show what has been done in the period of twelve years since then. The total outlay on our six stations was then £347,000; it is now (as far as we are able by anticipation to tell, our accounts not being closed till March 31) £640,000, showing an increase of £293,000. The working capital is now in excess of the sum required formerly by about £30,000, showing a total addition of £323,000. The creation of shares in 1862 was 12,000, upon which £7 10s. each has been paid, making £90,000. The loans and debentures have been increased by £25,000, and this amount, added to the £90,000, makes £115,000, leaving the sum of £208,000 to provide the profits which have been used, whether they appeared under the head of "Depreciation and Redemption Account," or "General Revenue Account," or as accruing returns of the current year. That it was preferable to do this than to invest these accumulations in Consols at 3¼ per cent., and at the same time to raise the capital required by an issue of shares upon which we should have had to pay 10 per cent. per annum, I think is self-evident to every one in the room. But we, the directors, think we have now reached our limits, and that we must have more capital to go on with. We cannot at this time call up the £2 10s. per share upon the 12,000 new shares created in 1862, and for this reason, that we have exercised our powers, and borrowed on mortgage or debentures to the full extent of that amount, and we are forbidden to go beyond it by our deed. An increase of available capital is therefore essential. We have deferred it as long as possible, but the time has now come when it must be provided. This subject we have long and anxiously considered, and we have come to the conclusion that the scheme of which you have received notice, and which we ask you to adopt this day, is the best we can devise under the circumstances. It is disadvantageous, especially in a foreign country, to appear to be making large profits on a small investment of capital. That is a powerful reason why, for the good of this undertaking, the total issue of shares into which the capital is divided, as appearing in the list of quotations, which are open to daily observation, should represent, more nearly than it does, the actual expenditure at the stations. We have felt this all along, but we were reluctant to propose a large increase of nominal capital until our tenure and position at all the stations was made perfectly secure. Now our present outlay, as I stated before, is £640,000, added to which is the value of fittings, meters, coals, coke, &c., in stock, and working capital generally, £62,000. Our liabilities for land and property purchased at various times, and payable by instalments, is £28,000. A rough estimate of additional works, to be erected during the next few years, shows a minimum of £51,000, making a total outlay of £781,000. Our nominal share capital is nothing like commensurate with that. It now consists of 35,406 shares of £10 each, making £354,060. By doubling this it will be raised to £708,120, which will still be within the limits of the present and prospective outlay, but we think it will go far enough, at all events for some years, and, therefore, we believe that as a matter of policy the wisdom of the step we now propose is proved. I have stated that, of which you were doubtless aware, for we have always set it forth in the accounts laid before you, year after year, at the meetings of shareholders, that a large sum, forming the difference between the amount received from shares and debentures and the amount of our actual outlay, has been temporarily provided out of profits. And that has arisen in this way. This company and others were the pioneers of gas lighting in France, and so difficult were the first steps in the introduction of what was then a new mode of lighting, that I suppose none of the promoters of this undertaking ever thought of the possibility of competition, and therefore but few efforts were made to secure their position by obtaining long exclusive privileges from the authorities of the different towns in which their operations were carried on. I need not say that this was a serious omission, and that we have suffered severely from opposition in consequence. It has been the constant work of your directors for about 25 years to remedy this error, and to establish the company securely, as at length we have succeeded in doing. We have now obtained exclusive concessions at every one of our stations for long terms—terms which, on the average, have yet 35 years to run out. During that trying period of suspense we were conscious of our weakness, and we considered it necessary to reserve out of the profits every year more than sufficient to meet the ordinary depreciation to which the plant of a gas-works suffers, fearing that we might see our business arbitrarily taken from us without the possibility of remedy, and conceded to others, as has unfortunately occurred in the case of several large French towns. This reserve of profits we felt ourselves bound to make so long as we were left insecure in any one of our stations. But the last of the six concessions being now definitively settled, we feel that the day has come to divide amongst our shareholders a sum representing a large portion of that which was reserved in excess of probable requirements from time to time. We were urged some time ago by several shareholders to take this course, or, at all events, to deal with the matter; but until now we did not feel justified in doing so. The "Depreciation and Redemption Account" on March 31 will amount in round numbers to about £220,000. We purpose taking from this a sum sufficient to credit each of the new shares we shall ask you to authorize the creation of, with the sum of £4; making, altogether, £141,624. This will leave a balance of £78,376, which, with further annual additions and interest, will be amply sufficient to provide most fully for any probable depreciation or loss of property at the termination of our concessions. It would have been more simple, perhaps, to have effected this division by giving you a bonus of £4 per share at the next dividend, but the best reason for not doing so is that we have not got the money. The money has been already spent on the works, and, as I have before stated, we could not, without manifest absurdity, raise new capital and receive calls thereon with one hand, while we were paying back the amount in bonuses with the other. The next best thing to do was, undoubtedly, to give the shareholders individually some good title to the amount expended, and, as I have already shown that we require additional capital, it was obviously convenient to combine the two operations in one scheme, so as to make an allotment share per share, and omit no one, an arrangement we could not have carried out without exactly doubling the present number of shares. We intend to make a call of £1 per share as evidence of the acceptance of the shares by the allottees, and when we require further calls we shall in preference call up the £2 10s. on the 12,000 shares, upon which £7 10s. has been already paid, which we cannot do at the present moment for the reason I have given you. As regards borrowing powers, we have authority, which has been already duly exercised, to raise £75,000, and, in addition, the further amount of any uncalled capital upon shares. We now ask you to extend this power to the uncalled capital, as it will stand after the creation of the new shares, and which I may add, without, however, pledging myself and the board in any way, we do not intend to call up unless urgently required. It is clear that having to pay dividends on a much larger capital, we must manage our business so as not to produce the unfavourable effect of bringing the rate of dividend down too heavily. We will do our best to maintain it as at present, but whether we shall continue to pay a bonus, and if so, how much, and how long we shall be before we do so at the present rate, is quite in embryo, for we can never tell till the end of the year, when we make up our accounts, and our profits are properly ascertained. I may mention now that the new shares will participate equally, according to the calls paid and taken as paid, in all future dividends with the other shares, after the 1st of August next. But it is clear that as this scheme cannot be realized till the month of April, the new shares will have no claim to participate in the earnings of the company before that date. I now, with your permission, beg to move the resolution that has been prepared, and which will be read by the secretary. It will have to be passed by a statutory majority—*i. e.*, by three-fourths of the shareholders present; but the benefits to be derived from the adoption of the scheme are so self-evident, that I hope and believe it will be carried unanimously.

The SECRETARY then read the following resolution as that moved by the chairman:—

That, concessions for long terms of years having now been obtained for supplying gas in all the towns and districts so lighted by the European Gas Company, Limited, and additional capital being required to carry on its constantly growing business, the capital of the company shall be increased by the issue of 35,406 new shares of £10 each, to be allotted, share per share, to the holders of the present 35,406 shares in the company, and that each such new share shall be credited with £4, to be taken out of the accumulated undivided profits of the company, now forming part of an account in the books of the company, under the title or name of "Depreciation and Redemption Account."

That the first call on such new shares shall be £1 per share, on allotment which amount, together with the said sum of £4 per share, to be credited as above, shall represent £5 per share, to be taken and considered as if the whole had been actually paid at the same time on such new shares.

That if, on or before a date to be fixed by the directors, the said call of £1 per share shall not have been paid, the directors shall have power to dispose of such unaccepted allotments, on such terms and conditions as the said directors shall deem expedient, for the benefit of the company; the payment or non-payment of the call to be considered

as conclusive evidence and proof of the acceptance or refusal by existing shareholders of the allotment of such new shares, with the advantages and liabilities resulting therefrom. Further calls, if any, to be made at such times, and for such amounts, as the directors may think fit.

That such new shares shall in all other respects be subject to the same laws and liabilities, and be entitled to the same rights and privileges, as the present existing shares.

That clauses numbered 3, 29, 30, and 31, of the regulations of the company, and the special resolution of the company, passed on Aug. 13, 1862, and confirmed on Sept. 17, 1862, shall be considered as specially altered, amended, and controlled by this resolution, and shall be read and acted upon as if the increased capital herein provided for had formed part of their original provision; and that clause 82, as to the division of dividend and bonus of the company, and all other clauses of the said regulations and all special resolutions of the said company, shall be construed and made applicable to the increased capital hereinbefore provided; so that, in effect, the borrowing powers of the directors shall be extended to the full amount remaining uncalled or unpaid on such new shares before mentioned, in addition to the £75,000 borrowed under clause 32 of the company's regulations and the special resolution of the company, passed on Aug. 7, 1861, and registered on Sept. 19, 1861; and that any loans raised in the exercise of these extended powers shall be at such rate of interest, in such total or separate amounts, and subject to such terms, with power of renewal from time to time, as the board of directors shall see fit, and shall be secured on the property of the company by any of the instruments and in the manner prescribed in clauses 33 and 34 of the regulations of the company, as the directors shall see fit; and that all the clauses of the said regulations and special resolutions of the company shall be construed, in connexion with these powers and this additional resolution, so as to carry out the same, and make them effective.

The CHAIRMAN: If the resolution is adopted, we shall have to hold a special meeting to confirm it, and the directors propose that such meeting be held on the 11th of March next. In the meantime the books will be closed for transfers from the 2nd to the 11th of March, so that the allotment letters may be sent out at the termination of the second meeting, and that the call may be made payable on the 2nd of April. The entire operation will then be completed by the issue of certificates, which will be ready for delivery, in exchange for the bankers receipts, on the 15th of April. I may add that the directors are most anxious that every shareholder should avail himself of the great advantage to which he will be entitled by the proposed issue of these new shares, and they will afford every facility for the purpose. It may happen, however, in some cases that the present holders are unwilling, or disqualified as trustees or executors to add to their present investments, or may not like to assume the responsibility. If there should be any such, they may obtain at this office the forms enabling them, without incurring any liability, to renounce their allotments in favour of other persons who are willing to accept them, and pay for the valuable privilege of taking them up. I hope no one will neglect to do this in time, because after the 2nd of April the opportunity will have passed away.

Mr. FAWCETT seconded the resolution.

Mr. STOKES expressed himself very much pleased with the able statements made by the chairman, and with the proof which had been afforded to the meeting of the great care and attention bestowed by the directors in the management of the affairs of the company during a long course of years.

Mr. BADDELEY said he thought the shareholders would best consult the convenience of the meeting, and the interests of the company generally, by adopting, without discussion, the proposals which had been laid before them. He was sure that every one present cherished the utmost confidence in the board, and therefore when they were told, as they had been, that the directors had carefully considered and agreed upon the scheme now recommended, it was not necessary that they should occupy time in analyzing it in all its details.

Mr. LIVESEY said there was no question that the shareholders would heartily approve of the resolution just proposed. He had had a great deal to do with English companies, and he could not help remarking that if such a scheme had been proposed and sanctioned by a gas company carrying on its business in this country it would have been open to very grave censure, on the ground that to appropriate a portion of profits to capital purposes for a long series of years, and thus deprive the shareholders for the time being of so much of the earnings of the undertaking, would properly have been considered a great injustice. But, in the case of this company, the circumstances were different. He had taken the opportunity of seeing Mr. Backler recently in reference to this proposal, and he ascertained that the great reason why a portion of the profits were yearly reserved as they had been was the unsettled state of the concessions held by the company. Such being the case, he could not but agree that the course pursued by the board had been a most judicious course. At the same time, he thought the question should now be brought before their consideration whether, in future, they should not divide the profits annually more closely than they had done in the past. He, for one, would leave the matter in the hands of the board, because he had great confidence in their judgment, and was sure they would pursue that policy which was likely to subserve the best interests of the company. But he could not help feeling that the present shareholders were deriving the benefit of the last 12 years, and that those who sold their shares six months ago lost it all.

A SHAREHOLDER asked what the balance of the reserve-fund would be.

The CHAIRMAN: £78,376.

A SHAREHOLDER asked whether the new shares would be entitled to participate in the next division of profits.

The CHAIRMAN said the accounts of the company were made up once a year, and the year ended with the 31st of March. It occupied four months from that time to make up the books, and therefore the dividend paid in August was the dividend for the half year ending with March. The new shares could not participate in profits until they were created; they would not be created until April, and therefore the first dividend to which they would be entitled would be payable in February, 1875.

A SHAREHOLDER said he thought, instead of creating new capital, it would have been better to call up the £2 10s., still uncalled on the 12,000 new shares. The effect of the present proposal would be that the shareholders, instead of being liable for £2 10s., would be liable for £7 10s.

The CHAIRMAN said he had already explained that, having issued debentures to the extent of the money uncalled on the new shares, the directors were not in a position to call up the £2 10s., which remained as a security to the debenture holders.

Mr. CHALONER SMITH said he would remind the hon. proprietor who had just spoken that by the proposal of the directors the holders of the new shares were treated with great liberality, inasmuch as they were placed on precisely the same footing with respect to their £7 10s. paid up, as the old shareholders who had paid up £10 per share.

Mr. PEILL thought the complaint that the last new shares were not called up originated entirely in a misunderstanding of what the chairman had stated. No doubt as soon as they required the funds the board would call up the amount due and relieve the company of their debenture obligations.

A SHAREHOLDER asked whether he was to understand that the £2 10s. would be called up before any calls were made on the shares now about to be created.

The CHAIRMAN said he should like it clearly to be understood that at the present time the reason why the directors did not call up the £2 10s. on the 12,000 shares was that they had already anticipated the amount by borrowing money on debentures, and, therefore, they were obliged to leave this call as a security. Upon the shares now to be created there would be £1 each paid, which would give the board something like £35,000 to go on with. When they had exhausted that, they might then call up the £2 10s., which they would have done sooner, had they not placed themselves in the position he had mentioned.

A SHAREHOLDER asked whether, while the reserve-fund had been used as capital, it had been credited with interest out of the annual profits.

The CHAIRMAN said it had.

The motion was then put and carried unanimously.

A cordial vote of thanks was then given to the chairman and directors.

The CHAIRMAN, in acknowledging the vote, said it was a great pleasure to the board so see so many shareholders present, and to find that they were unanimous in their approval of the course taken by the directors. As he had stated before on many occasions, they gave their best consideration to the affairs of the company, and should continue to do so while they enjoyed the confidence and approval of the shareholders.

A vote of thanks was also presented to the secretary.

Mr. BACKLER, in acknowledging the vote, said he had been accustomed for the last 20 years to receive the thanks of the shareholders at their half-yearly meetings, but each time the vote came to him with additional gratification. The management of the company necessarily required a great amount of care, and the exercise of a proper economy. He had endeavoured in these respects to do his duty, and was pleased to receive the assurance that his services were acceptable to the shareholders.

LIVERPOOL UNITED GASLIGHT COMPANY.

The Half-Yearly General Meeting was held on the 17th inst.—Mr. THOMAS EARLE, chairman of the board of directors, presiding.

The SECRETARY (Mr. P. F. Garnett) read the report, as follows:—

At the last annual meeting of the company, the directors intimated the necessity of making some increase in the price of gas for the maintenance of the usual rate of dividend during the year then ensuing. On the best estimate that could be formed, it appeared to the directors that a very small addition would suffice for the object in view, and they accordingly increased the price by 3d. only per 1000 feet. The directors regret to state, however, that, owing to an unlooked-for excess in the cost of cannel, the expenditure has been much greater than anticipated, and the estimate of profits for the half year ending the 31st of December last does not justify the board in recommending the proprietors to declare the interim dividend for that period at a higher rate than £3 10s. per cent. on the ordinary stock as well as on the £7 per cent. shares. The directors hope nevertheless than by increasing the price of gas to 4s. 3d. in the borough and 4s. 6d. in the out-townships, the full statutory rate of dividend may be obtained within the current year. After the transaction of the ordinary business, the proprietors will be invited to pass a resolution for the conversion into consolidated stock of the 7 per cent. £25 shares, which have been issued under the authority of the resolution passed by the proprietors at their general meeting on Aug. 20, 1867, and in respect of which the whole capital has been paid up.

The CHAIRMAN, in moving the adoption of the report, said that no doubt it would be a great disappointment to shareholders that they could not declare the usual dividend on the whole stock. The reason for this he would explain. It was that they were unable to obtain a sufficient supply of Wigan cannel, and were compelled to fall back upon other kinds of fuel, at a high price, and which did not possess in so great a degree the necessary requirements for gas manufacture. The directors, however, hoped that before long there would be a favourable change in the market, of which advantage might be taken. Though the price of coal had lowered, it did not necessarily follow that cannel, so largely employed in the making of gas, would do the same. Cannel was of primary importance, seeing that it gave a higher illuminating power than any other material for gas making. As to the quality of the gas, that had been strictly maintained, and he believed it would compare favourably with the gas of any other town in England—it was better than most, but as good as any. At one or two towns in Scotland the quality might be higher, but the price was proportionately increased. With these prospects before them the directors had found it necessary, though very reluctantly, to raise the price of gas. He hoped to be able at the next meeting to present the shareholders with a better state of affairs. They were anxious to reduce the price of gas as soon as possible, and had no wish to be found fault with by the public, as no doubt they would be. With regard to the dividend usually paid he wished to make a remark. Perhaps few were aware that in the early days of the undertaking many shares had been issued and sold by public auction under the provisions of their Act of Parliament. These amounted to £178,548; they were issued at a premium, and on that amount no dividend was ever paid; therefore it followed that the dividend paid on the whole consolidated stock was only a little over 7 per cent., and not 10 as had been stated. He concluded by moving the adoption of the report.

The motion was seconded by Mr. CHARLES TURNER, M.P., and adopted unanimously.

On the motion of Mr. J. G. MORRIS, seconded by Mr. READE, it was resolved that a dividend for the half year ending the 31st of December last, at the rate of £3 10s. per cent. on the consolidated stock of the company, and on the paid-up capital of the 7 per cent. shares respectively, be now declared, payable to the proprietors on the 20th inst., less the income-tax.

Another resolution was formally submitted to the meeting and adopted, giving power to convert or consolidate the 7 per cent. £25 shares in the capital of the company into a general capital stock, to be divided among the holders of such shares, according to their respective interests therein, pursuant to the company's Act of Parliament.

IPSWICH GASLIGHT COMPANY.

The Annual Meeting was held on the 17th inst., Mr. WM. BUNN (chairman of the board of directors) in the chair.

The notice calling the meeting and the minutes of the last general meeting having been read,

Mr. E. GODDARD, the manager of the company, read the report of the directors as follows:—

Your directors, in presenting their annual report, have pleasure in stating that during the past year the operations of the company have been satisfactory.

The contract for coal made in 1871 was continued to June last, when an advantageous arrangement was made with the colliery proprietors to double the quantity of coal due upon the old contract at an advanced price, but much below the current rate. This contract has nearly run out, and your directors will for the ensuing year's supply of coal have to pay a higher price than for last year's.

The statement of accounts, which has been carefully examined and certified by the auditors, shows the total receipt on revenue account, including a balance of £153 8s. 8d., brought forward from last year, to be £24,296 0s. 9d., and the expenditure to be £19,717 7s. 9d., leaving a balance of £4578 13s. available for dividend.

Your directors recommend the payment of a dividend at the rate of 10 per cent. upon the original share capital, and 7½ per cent. upon the new share capital, and that the balance of £318 5s. 9d. be carried forward.

In order to meet the public requirements it will be necessary during the ensuing summer to make some extension and alteration both to the manufacturing and distributing plant. In the outskirts of the town at the low levels the means of supply has not been adequate to the demand; it is purposed, therefore, to replace some of the existing mains with others of larger dimensions. It is also contemplated to erect an additional scrubber at the works, which will render it unnecessary to extend the condensing apparatus at present.

The following directors go out of office by rotation, but are eligible for re-election, viz.:—J. P. Cobbold, Esq., M.P., S. B. Jackaman, Esq., and Wm. Alexander, Esq.

Mr. Roper Sheppard goes out of office as an auditor, but is eligible for re-election.

Mr. GODDARD also read the statement of accounts.

The profit and loss accounts showed on the credit side:—Balance from last year, £153; public light rental, £1897; private light rental, £15,961; rental of fittings, £70; do. of meters, £409; residual account coke, £5935; tar, £386; ammonia, £360; gas fittings, £143: rent of land, £38. The total was £24,296. On the debit side among the principal items were interest on bonds, £630; rates and taxes, £825; repairs and workmanship, £326; retorts, £548; salaries and wages £2391; directors and auditors, £221: street lamps, £513; coal and cannel, £12,417. The balance as stated in report was £4578 13s.

The CHAIRMAN moved the adoption of the report, observing that he did not think there was anything calling for comment from him.

Mr. W. B. JEFFRIES seconded the motion, and it was unanimously agreed to.

It was then resolved that a dividend of £1 on the old and £15 on the new shares should be paid. The retiring directors, Mr. J. P. Cobbold, Mr. S. B. Jackaman, and Mr. W. Alexander, were re-elected, and Mr. J. R. Sheppard was re-elected one of the auditors.

Mr. R. GARROD proposed and Mr. S. WESTHORP seconded a vote of thanks to the chairman, who briefly responded, observing that all the members of the board attended very strictly to their duties, it being very seldom that any director was absent from a meeting unless he was away from the town.

Mr. JEFFRIES proposed a vote of thanks to Mr. Goddard for the very efficient way in which he discharged the duties of manager. If they had not so efficient a manager they probably would not have so satisfactory a balance-sheet.

Mr. ACFIELD seconded the motion and it was unanimously agreed to.

Mr. GODDARD said it was a source of great pleasure to him to see the concern go on so prosperously. There was nothing to call for special remark except that they had had to pay something like £2000 more for coals than in the previous year, but that expenditure had been met by the advanced price of coke, and also by the increase on the private light rental account, so that the directors had been able to give the shareholders the maximum dividend.

BRIGHTON (CORPORATION) WATER-WORKS.

The following is the Report of the Water-Works Committee, presented at the Meeting of the Brighton Town Council on the 18th inst:—

Your committee beg to submit a statement of accounts for the 18 months from the transfer of the undertaking from the directors (July 1, 1872) to Dec. 31, 1873.

The committee have had to deal with very exceptional circumstances from those anticipated in the estimate upon which the corporation relied in negotiating the purchase of the undertaking.

At the very time that the business was taken over, a sudden rise in the price of coal occurred, and the increased cost became so great as to make it very doubtful whether the earnings would meet the expenses thus entailed.

The committee resolved to defer the appointment of an engineer, for which £300 was provided in the estimate, and thus up to the present time a saving to that extent per annum has been effected. They were enabled to take this course through the assistance of Mr. Craven (one of the committee), whose valuable advice in engineering matters the committee desire to acknowledge.

An annual increase in water rentals, based upon the average of several years, was referred to in the estimate as the source of prospective profit to the corporation, and this increase has not only been realized, but has been doubled, and this has, in part, provided the means of meeting the extra cost of coal.

The other expenses are within those of the estimate, and the committee have throughout given a very careful attention to economy and the general details of management. They have much pleasure to be able to report, as the result of their efforts, a profit of £408 16s. 11d. for the year 1873, which would be £1500 larger, but for the extra cost of the coal used in that period.

The machinery and plant have been maintained in good order, and the committee feel that there is good reason to hope that, with a reduced price of coal and increasing rentals, the water-works will prove a valuable property for the corporation.

The committee recommend that the sums of £204 16s. 11d. and £408 16s. 11d., making a total of £613 13s. 10d. (the profits in 1872 and 1873), be transferred to a contingency fund, in accordance with the provisions of the Act, and that the treasurer do invest the same in the purchase of 3 per cent. Consols, on the water-works account.—On behalf of the committee, (Signed) W. H. HALLETT, Chairman.

Feb. 3, 1874.

LIVERPOOL CORPORATION WATER-WORKS BILL.

MEETING OF OWNERS AND RATEPAYERS.

A Meeting of the Owners and Ratepayers of the borough of Liverpool was held on the 17th inst., in the council chamber of the town-hall, in accordance with the provisions of the Borough Funds Act, to consider the bill promoted by the mayor, aldermen, and burgesses to "enlarge the powers of the Corporation of Liverpool in relation to water supply and fittings, and otherwise to amend the Acts relating to the Liverpool Corporation Water-Works, and other purposes." The MAYOR (Alderman A. B. Walker) presided, and there was a large attendance.

The TOWN-CLERK having read the notice convening the meeting,

The MAYOR opened the proceedings by proposing the following resolution:—"That this meeting consents to the promotion by the mayor, aldermen, and burgesses of the borough of Liverpool of the bill in Parliament, entitled 'A Bill to Enlarge the Powers of the Corporation of Liverpool in relation to Water Supply and Fittings, and otherwise to Amend the Acts relating to the Liverpool Corporation Water-Works, and for other purposes.'"

Mr. WILSON, chairman of the Water-Works Committee, seconded the motion. He said that when he undertook the duties of the office to which he had been appointed he felt the responsibility which devolved upon him of seeing that the town was properly supplied with water; and from the report of the late water engineer, Mr. Duncan, all the water supply that could be relied upon in a dry season was 125 million gallons a week, which, when the new reservoir at Rivington was completed, would be increased to 126 million gallons. In 1872, 118 million gallons were distributed; and in 1873, 120 million gallons. The natural increase for the year of those taking water was 18,000, and it would be found that in 1874 the quantity required would be 126 million gallons, being 1 million gallons in excess of the present resources of the committee, and equivalent to their resources when the Rivington reservoir was finished. As long as they had rainy seasons they would be able to go on, but the first dry season they would see the supply reduced to an hour a day, the manufactories stopped, and typhus fever raging, as it was in 1865. As chairman of the Water Committee, and responsible for the supply of water for sanitary purposes, he felt the responsibility which rested on him to provide against such a frightful contingency. The natural increase of the population of the town must go on until 1882 before any additional supply could be obtained that he was aware of, and by that time the quantity of water required would be 150 million gallons a week. This was not the whole difficulty. There was the question of the wells. One-third of the supply was derived from the wells, and two of them—Bootle and Dudlow Lane—were notoriously in a dangerous condition. These yielded one-sixth of the whole supply of Liverpool, and they were told by medical officers that in the event of typhoid fever or cholera breaking out it would be their duty to call upon the corporation to close those two wells. There were two courses for the Water Committee to take. They might have let matters take their ordinary course, in which case by next year things would have come to a dead lock, and there would have been such an outcry that the committee would have obtained any powers necessary to put them on a proper footing. They felt, however, that this was an unworthy course to pursue, and that what they were bound to do was to take the matter boldly as it stood, and endeavour to find out whether it was possible to stave off the evil day. They found that the powers they sought were possessed by Manchester and other large towns. In Norwich, the old intermittent service of 40 gallons per head per day was converted to a constant service by these powers; in Cambridge, the domestic supply was reduced by the same means from 22 gallons to 11 gallons per head per day; and a similar saving was experienced in other towns where precautions against waste were adopted. The result of the inquiries which the committee made was that they reorganized their staff, licensed plumbers, stamped the fittings, and established a system of gauging the consumption of water in each district. They thus became convinced that it would be possible to give a constant service to the town, instead of an intermittent one, up to the year 1882; but they also found that their powers were lamentably inadequate to the task they had taken in hand; and they resolved to seek additional powers. There were three classes of opponents to the bill. One class said that the powers sought for were too arbitrary; another, that the modifications were far too great, and that the bill was not worth going for; and the third did not want any bill at all, being of opinion that bad fittings should not be interfered with, but that the present state of things should be allowed to continue. As far as the arbitrary powers were concerned, the committee, finding that there was a very strong feeling on the part of the ratepayers, had made a series of concessions which virtually reduced the bill to the lowest point at which it would be possible for the committee to carry on the service. He regretted that the powers of the committee were not more arbitrary than they were likely to be under this bill. Having explained the nature of those powers and the matters with which they would enable the committee to deal, Mr. Wilson said it was the desire of the committee to give a constant service, and if it was the wish of the town to have that constant service, they must give the committee the powers that were necessary to ensure it. The water in the cisterns of cottage property was generally covered with soot and dirt, and unfit to drink; and he believed the Water Committee had been—perhaps inadvertently—the cause of driving many a man to drink. The water was simply undrinkable. He wished the responsibility to rest on those who prevented the committee from carrying out what would be a sanitary improvement of the utmost importance. If the ratepayers would clothe them even with the modified powers they now asked for, they were prepared to assume the responsibility of substituting a constant for an intermittent service, and to carry it on until a new supply could be obtained.

Mr. W. PIERCE, president of the Land and House Owners Association, said he thought that the passing of the Borough Funds Act was one of the most fortunate things which had occurred for years past. Alluding to the bill promoted by the corporation, he remarked that it was mainly centered in the 5th clause, which related to the fittings; but, although Mr. Wilson had told them of a variety of things, he had said nothing at all of any waste of water arising from imperfection of the fittings. What this 5th clause meant was, that whatever fittings they had, good or bad, if they did not happen to suit the nicety or peculiar feelings of the borough engineer, or somebody else, they could be stripped from top to bottom. This went to the marrow of the whole bill. Of course, if the powers asked for under this 5th clause were essential for the purpose of saving water, it would be then a matter of great consideration whether they should not be allowed; but he contended that nothing of the kind had been shown. It was a most strange circumstance that, notwithstanding the dreadful state of things as depicted by Mr. Wilson, they were still living; and, as far as he could judge, it had not had the awful effect of sending them to the public-house. He asserted that different Acts of Parliament which had previously been passed with regard to the water supply of Liverpool, and especially that of 1862, contained clauses which already conferred the powers now asked for; and, in fact, they were more strict and stringent than those which existed in Norwich and Manchester. The great mistake that had been made was to undertake the supply to the out-townships; for, so far as regarded Liverpool itself, they had an abundance of water for all their purposes, if they had not to provide for others. Those present had as much interest in the welfare of Liverpool as the Water Committee themselves; they believed, at the same time, that Mr. Wilson had done all that he had with the best intentions, though with a zeal perhaps a little too excited. Reverting to the Borough Funds Act, Mr. Pierce said that, supposing that measures had been passed 20 years ago, the rates of the borough would not have increased during that time 421 per cent. They, however, had the Act now, and he asked them to make use of it.

Mr. W. BENNETT said sections 67 and 68 in the Liverpool Water-Works Act of 1862 were copied almost verbatim, in each instance, from the Norwich Act of 1859, the Sheffield Act of 1860, and the Manchester Act of 1860; and they are also embodied in the Leeds Act of 1867. Section 69 of the Liverpool Water-Works Act of 1862 formed part of the Manchester Water Bill of 1868. The powers contained in these sections, in the hands of an experienced water engineer, were amply sufficient to reduce waste from defective fittings to a minimum. Norwich had reduced its supply from 40 gallons per head per diem to 10; and, with the powers the corporation already possessed, an experienced engineer could do the same for Liverpool. The consumption could not only be reduced to that amount, but they could add double to the supply of different trades, for they had enough water at command for the next half century.

Mr. R. RADCLIFFE suggested that the corporation should purchase from the Liverpool and Leeds Canal Company the water which they were compelled to supply to them, and which he said was of the very best quality. The canal itself might be supplied by pumping from the coal-beds or the sea, and he thought that any how they would have no difficulty in giving the canal company compensation in kind. The present water bill he denounced as a most monstrous proposal, and a disgrace to those who had conceived it.

After several other speakers had addressed the meeting in opposition to the motion,

Mr. WILSON replied, and, on a show of hands being taken, the resolution was negatived by a large majority.

Mr. WILSON thereupon demanded a poll.

The proceedings, which had been conducted amidst much excitement, then closed with three cheers for the mayor.

SPECIAL MEETING OF THE TOWN COUNCIL.

A Special Meeting of the Town Council was held on the 18th—the MAYOR presiding—for the purpose of taking into consideration the advisability of proceeding with or withdrawing the water bill, the resolution to consent to its promotion having been negatived at a meeting of owners and ratepayers on the previous day. At a former meeting of the council it was moved by Mr. Picton, and seconded by Mr. Jennings—"That in the event of the resolution to consent to the promotion of the water bill being negatived at the meeting of owners and ratepayers, to be held on Feb. 17, or in the event of the same being carried and a poll being demanded, it is not advisable to proceed further with the bill during the present session, and that the same be withdrawn." On that occasion the debate was adjourned.

Alderman WEIGHTMAN, who moved the adjournment of the debate, said that as the meeting on Tuesday had decided that the bill was totally unnecessary, it was for the council to consider whether it was wise, under the circumstances, to do that which in all probability might result in the defeat of the committee. The decision of the meeting having been given, the terms of Mr. Picton's resolution would have to be altered. He therefore moved that, the resolution to consent to the promotion of the water bill having been negatived at the meeting of owners and ratepayers, no poll be proceeded with, and that the bill be withdrawn.

Alderman WOODRUFF seconded this proposal, because he felt that the bill had been so altered it was not worth the expense and trouble of going on with it.

Mr. RATHBONE did not think that any interpretation could be put upon the meeting which had been held, except that the town had absolutely abstained from taking any part in the proceedings; for when only 150 persons met, such a meeting as that showed that the town had not given its sanction to the course that meeting adopted. Let the question be decided by a poll, and not by the force of a public meeting. His vote would be entirely governed by whether the chairman of the Water Committee could assure the council that he had not so much weakened the bill as to make it utterly useless.

Mr. WILSON said that all the concessions in regard to the bill had been granted upon the express condition of the opposition being withdrawn. It would still lie with the council to modify the bill if they chose after going to

the poll. The position which the Water Committee intended to take was this—they asked the council to appeal to the town by a poll, and they were anxious to put the decision of the ratepayers in this simple form—Did the Water Committee possess the confidence of the ratepayers or not? Did the Land and House Owners Association represent the public feeling of Liverpool, or did the Water Committee? The committee were quite prepared, if they found they had lost the confidence of the people at Liverpool, to place their resignation in the hands of the council.

Mr. FORWOOD said he should vote for the motion, not because he was opposed to the principle of the bill, but on the ground that they could not instruct the ratepayers sufficiently to get a fair and proper opinion at the poll. The bill in its amended shape commended itself much more to his consideration than when it contained the original arbitrary provisions; and he believed that if the Water Committee had introduced it at first with these modifications there would, in all probability, have been much less opposition to it. As he understood the matter, they were now to take the bill with all its original stringency. If so, they would have great difficulty in getting the decision of the ratepayers in favour of it, particularly when, as they knew, they would have the members of an association of considerable weight turning themselves into canvassers with all the paraphernalia of an election, while the corporation would be standing idly by.

The TOWN-CLERK, in reply to inquiries, said the polling papers would be collected on the third day after being sent out, and the cost of the poll to the ratepayers would probably be about £600 or £700.

Mr. WHITLEY said the chairman of the Water Committee had failed to convince him that the bill would effect the purpose sought to be accomplished. He himself believed that the present Acts of Parliament, imperial and local, were quite sufficient to attain the object desired, and he was bound to point out to the council that the manner in which this bill was brought before them was not sufficient to commend it to those who were not members of the Water Committee. Believing that the bill was a vexatious one, he thought the council would be very unwise in pressing the measure. He hoped the Water Committee would feel that the council and the public at large had general confidence in their management, and he should be very sorry indeed if the chairman of the committee, for whom they all entertained every possible respect, should think it his duty to press the bill forward.

Dr. GILL thought it was most desirable that the council should give their support to the committee, even if only on sanitary grounds, for the effects would no doubt be most disastrous if there should come a dry season or two.

Mr. HUGHES, as a member of the Water Committee, said it was only fair to state that the committee were unanimous in support of the bill, and that so far from the committee being, as had been stated, already clothed with the necessary powers, the question having been raised before the draft of the bill was prepared, the committee were advised by the town-clerk that the clauses in the present Act were altogether incapable of dealing with the matters with which they wished to deal. He did not regard the meeting of the previous day as at all a fair representation of the ratepayers of the town, and the conduct of those who attended was most uncourteous and discreditable. He hoped the council would insist on a poll, and then they would have the real voice of the people of Liverpool who had an interest in the question.

Mr. SAMUELSON thought that the first duty of the council was to endeavour to get the Borough Funds Act repealed, for so long as that obnoxious Act stood in their way they would be able to obtain no satisfactory legislation; and the disorderly character of the meeting in question was one of the best reasons they could possibly have for going to Parliament and asking for the repeal of the Act. The water bill contained, in its original state, provisions of such a kind that he thought it would be dishonest to enforce them. If the corporation were not disposed to be satisfied with the fittings which had been supplied by respectable plumbers for a number of years, let them supply the fittings themselves. He thought it would be a great improvement if the committee were to supply cisterns, as the gas company supplied meters, and they would be the means of returning an annual income in the shape of interest. With regard to the question of contamination, they had power under the Health Act to deal with that, and beyond that he thought it was unnecessary to go.

Alderman LIVINGSTON said the one question which was mooted to the meeting on the previous day, resolved itself into the simple fact, that any improvement involved the payment of money, and he was perfectly satisfied that if the sense of the inhabitants of Liverpool were taken, it would be that the Water Committee were bound to proceed with the bill.

Mr. HARRISON said the question as to the waste of water was one that some persons did not seem to appreciate. The waste of water during the last few years had been perfectly astounding. One-fourth of the domestic supply of water to Liverpool had been wasted, and to no use in a sanitary point of view, but a positive loss to the community. The chairman of the Water Committee had shown the position of the council and that of the ratepayers upon this question of the water supply and he (Mr. Harrison) thought it was worth while to test the matter, and see how far the people would take upon themselves the responsibility of rejecting the proposed bill, which, if adopted, would save such a quantity of water.

The council then divided, when the motion was negatived by 21 to 13.

The demand for the poll, therefore, stood, and the town-clerk said it would take place about the first week in March, and public notice would be duly given of the date.

PROPOSED PURCHASE OF THE TUNBRIDGE WELLS GAS-WORKS BY THE LOCAL BOARD.

PUBLIC MEETING AT THE TOWN-HALL.

On the evening of Wednesday last a Meeting was held at the Town-Hall for the purpose of considering the advisability of purchasing the gas-works by the town. The meeting had been convened by the chairman of the local board at the request of several members of the ratepayers association. The Hon. F. G. MOLYNEUX presided.

The CHAIRMAN commenced the proceedings by announcing the purpose for which the meeting had been called, and said that it was in consequence of a resolution passed at a meeting of the ratepayers association, who were desirous of ascertaining the opinions of the ratepayers of Tunbridge Wells on the subject of the gas. He had, therefore, a great deal of pleasure in calling the meeting on such a great and important question. He might say, speaking for himself and also his brother commissioners, that it was his and their desire to ascertain the exact feeling of the towns people. He need not say that they had no personal interest whatever in the matter beyond the good of the town. All they wanted to know was the real opinion of the ratepayers as to whether the lighting of the town should remain in the hands of a company, or whether the local authority should take it in their own hands. There would be no doubt a difference of opinion upon that point. He would not express any opinion of his own; but, speaking generally, he might say that as the lighting of the town was a very important matter to the comfort and welfare of the inhabitants, it should be in the hands of the local authority. He entertained this opinion very strongly indeed, and when he made this remark they must not suppose that he was in any way finding fault with the manner in which the gas company had for many years performed their duty. They had performed their duties admirably, and he had no doubt if they continued to have the management of the lighting of the town they would go on in the same manner. At the same time it was for the meeting to decide whether it would be better for the town to have the immense powers which were applied for by the company. A town like Tunbridge Wells would have no interest in making it a paying concern so far as giving profitable dividends to shareholders. The company had declared large dividends; in fact, as large as the law allowed them to declare. The town would only devote the profits either to the decreasing of the price of gas, or to the diminution of the local rates. Another question which would come before the meeting was the great advantage there would be in removing the works to another site. The gas company had applied to Parliament for a bill, in which they asked for the necessary powers to extend their works, and the site which they had suggested was decidedly in a picturesque part of the neighbourhood—he would not say in a bad locality, whereas the commissioners had in view a very advantageous site, for which they would not have to go to any expense in purchasing, so that there would in that way be a great saving to the town. They would have the same facilities for supplying gas as the company had at the present time. With regard to the healthiness or unhealthiness of gas-works, that was a point upon which doctors differed; but no one could deny that it was a great drawback to have such works in the midst of a populous neighbourhood. Whether the town took possession of the works, or the gas company retained them, one thing was sure—it was imperative that the works should be removed outside the town, and that no gas should be made or stored in the thickly populated parts.

Mr. CLIFFORD moved the first resolution, and in doing so said the gas company were vested with very arbitrary powers, and that all they seemed to study was the extraction of every shilling they could from the pockets of the consumers, and transferring it to the pockets of the shareholders. Had they considered the town a little more they would not have met with this opposition. He complained that the gas company increased their prices last autumn, when the higher price they obtained for coke fully compensated them for the increase in the price of coal. He then moved the following:—"That it is the opinion of this meeting that it is desirable that the gas-works should be removed from their present position, where they are injurious to health and inconvenient; and that no gas be made or stored within the limits of the town."

Mr. J. K. LAWTHER seconded the motion.

Several objections were made as to the words "injurious to health;" and the resolution was amended, the words "highly objectionable and inconvenient" being substituted.

Mr. J. F. SIMPSON, the solicitor having charge of the gas company's new bill, took an objection to the resolution being put at all, as it was, he contended, not contemplated within the notice convening the meeting, which was "to consider the propriety of the town taking the gas-works." He moved as an amendment that the resolution be not put; but the seconder, Mr. FIELD, afterwards withdrawing, the original resolution was put to the vote and carried.

Mr. CLIFFORD next proposed—"That in the opinion of this mee ing it is advisable that the town purchase the present gas-works, and take the public and private lighting of the town into their own hands." He said that a monopoly had been going on in this town which ought to be got rid of, and the only way to do so was for the commissioners to take the gas-works into their own hands, even if they did have to pay a little more perhaps than the works were worth. At Rotherham the commissioners purchased the gas-works, and the people of Sheffield laughed at them, and said they had burnt their fingers by giving too much money for them. But what was the result after twelve months management? They were able to supply better gas than they had been in the habit of having at a far less price, and put by a large sum, which went virtually to decrease the taxation of the town. He had no doubt that would be the case here. He next cited Manchester, where gas had been reduced from 5s. per 1000 to 3s. 8d., and in one year saved £62,000, which went to decrease the amount of local taxation. He considered that every gas company should supply meters free.

Mr. W. WAGHORNE seconded the resolution, but at the same time said he should like to know if the gas consumers would be really benefited by the town carrying on the gas-works.

Mr. BROWELL explained that the gas company paid 10 per cent. on the old shares and 7½ on the others, but then that should not be taken as the whole of the profits, because they had a very large reserve-fund.

Mr. BARTON thought the meeting should be put in possession of some facts as to what the probable cost would be.

Mr. J. SHARP expressed himself strongly in favour of the town taking the works, and said the present company had gone on quite long enough making such immense profits. He could not see what they would have to pay the present company, because, if the town started as an opposition company, the others would soon have to give up.

Mr. BROWELL considered it would be beyond all question better for the town to take the works, and it was not at all improbable they would then have gas as low as 3s. per 1000.

Mr. STEPHENS asked how much the town at present paid the gas company for public lighting, and

The CHAIRMAN replied that it was £2000 a year, and then the lamps were not lit on moonlight nights.

Mr. STEPHENS proposed that the local board should at once erect gas-works and lay down pipes. He said that with the £2000 they would have a good start, and he could guarantee that if they could show they could supply gas 6d. or 1s. less, all the consumers would go over to them.

Mr. EVAN JONES seconded this proposition.

Mr. ANDREWS thought they should come to reasonable terms with the gas company, if possible; and, at the suggestion of the chairman, the original resolution was amended—"That, in the opinion of this meeting, it is desirable that the town purchase the present gas-works, and take the public and private lighting of the town into their own hands, if the same can be carried out on reasonable terms. But if those terms cannot be agreed upon, the authorities should construct their own works, and undertake the whole lighting of the town."

The resolution, as amended, was then carried with two or three dissentients.

Mr. SHARP proposed the next resolution:—"That the proposition of the erection of the new gas-works in the neighbourhood of the High Rocks is open to serious objections, and would be detrimental to the best interests of the town; and this meeting hears with great satisfaction that the town authorities possess land admirably adapted for the site of gas-works."

Mr. BROWELL seconded the motion, and a long discussion ensued as to the relative positions of the two sites, upon which there was a pretty evenly divided difference of opinion.

On the motion of Mr. ADIE, seconded by Mr. ANDREWS, this resolution was withdrawn, it being considered premature to discuss the question until they had before the meeting the opinion of some skilled engineer.

A vote of thanks to the chairman terminated the proceedings.

PROPOSED PURCHASE OF THE WIGAN GAS-WORKS.

SPECIAL MEETING OF THE WIGAN TOWN COUNCIL.

A Special Meeting of the Town Council was held on the 18th inst., "for the purpose of receiving and (if approved of) confirming the minutes and proceedings of a meeting of the committee appointed to negotiate for the purchase of the gas-works, held on the 12th inst., and of making such orders and passing such resolutions thereon as the council and local board shall deem necessary." The MAYOR presided.

The TOWN-CLERK stated that, in pursuance of a resolution passed at the last quarterly meeting of the council, a committee—consisting of Aldermen Burrows and Cross, and Messrs. Knowles, Park, and E. L. Wright—were appointed to negotiate with the Wigan Gas Company for the purchase of their works. The committee held a meeting on the 12th inst., and were then met by Messrs. T.

Wall, W. S. France, W. Roocroft, R. Taylor, J. Fairclough, and J. S. Darlington as the representatives of the gas company, and it was resolved to recommend that the Wigan Gas Company's works, plant, stock-in-trade, and effects be purchased and sold at 22½ years' purchase on £5781 5s., the income of the company —£130,078 2s. 6d.—plus £150, bringing up the amount to £130,228 2s. 6d., excepting the book debts, and gas-meters and fittings on hand in stock at the works, stocks of coal and cannel, and the profits on the sale to the Hindley Local Board now made; the corporation to pay all proper expenses and take possession on the 1st of July, 1874, and the purchase-money to bear interest from that date after the rate of 4½ per cent. per annum until the completion of the purchase on the 1st of October, 1874. The present meeting had been called to consider these proceedings. The committee instructed him to inquire what was the amount of the reserve-fund of the gas company, and he had done so, and learned that it amounted to upwards of £10,000. Of course this was liable to the payment of the dividend, if necessary, of the last half year and of the coming half year.

Mr. E. L. WRIGHT moved—"That the minutes and proceedings of the committee appointed to negotiate for the purchase of the gas-works, held on the 12th inst., be and are hereby received, adopted, and confirmed." He said he was satisfied in his own mind that the purchase of the gas-works by the town was one exceedingly desirable to be made. If any of them held a monopoly such as that which the Wigan Gas Company now virtually held by the provisions of the Act of Parliament, they would not be likely to take less than the price which the gas company wanted, and in his opinion the gas company had met them liberally by 22½ years' purchase. He thought the proper way in which to regard the actions of a large concern, such as the gas company, in an affair of this sort was to think what they would do themselves if the property belonged to them, and at what rate they would prefer to buy or sell. Personally, he was sure it was a good purchase, taken with the extra £150, by including which they were only required to pay interest at the rate of 4½ instead of 5 per cent.

Mr. HILTON: I should like to know how the sum of £5781 5s. is arrived at. I have been given to understand for a number of years that the company have not been paying.

The MAYOR: That sum is the amount of dividend that has been paid.

Mr. WRIGHT said the committee were informed that the reserve-fund had gradually increased year by year, but they were told it was probable that the fund would have to be reduced, as the company during the past year had not paid the amount required for their dividend. But even if there was no reserve-fund at all, it seemed to him that it would be a desirable purchase, though he took it that there was a reserve-fund, and whatever that was the town would get the benefit.

The MAYOR said he had no doubt the members present were aware that the company had recently made large additions to their premises, having purchased the property belonging to Mr. John Preston. Works of an excellent character had just been completed, and he had no doubt the gas-works in Wigan, though perhaps they might not be so well managed, were in as good order as any works in the kingdom.

Mr. PEERS said, before the resolution was passed, he wished to ask if, in the opinion and to the knowledge of the committee, the ratepayers would benefit by the purchase of the works. Were they doing a good thing for the town, and one that the ratepayers were likely to profit by? For his own part he did not know much about the matter. Other gentlemen had studied the question more than himself, and he wished to learn whether in their opinion it was desirable to make the purchase.

Mr. WRIGHT replied that the committee were unanimously of opinion that the town would benefit very materially by the purchase of the gas-works, for not only would they have better gas, but, as the population of the town was rapidly increasing, there would be a still greater demand, and the works would become a very remunerative concern, and while the rich, who were the great consumers of the gas, would have an article of a better quality, the poor would also be benefited by the exceedingly advantageous purchase of a very valuable property.

The TOWN-CLERK, in reply to an inquiry, said he had heard that several of the out-townships were preparing to oppose the bill on the ground, as he understood, that it contained a clause seeking for powers to increase the price of gas, if the corporation acquired possession of the gas-works. The corporation, as the Local Board of Health, had already the power, without any Act of Parliament, to buy and acquire the gas-works, and if they determined to buy them they could please themselves whether or not they withdrew from the bill the clause seeking power to raise the price of gas. If they did so, they might do away with the opposition, but if they did not, it was quite possible the corporation might negotiate with the out-townships. It was quite clear, however, that the townships could not prevent the corporation from buying the gas-works.

Questions being asked as to the present price of gas, and that which in the new bill power was sought to charge, the town-clerk read the section of the Wigan Gas Act which limited the price to 4s. 2d. within the mile radius, and 5s. 6d. outside the radius, with the usual discount, and also the 83rd section of the Wigan Improvement Bill, which asked that the corporation might have the power to raise the price not exceeding 1s. 3d. per 1000 cubic feet.

Mr. BRYHAM said that was 1s. 3d. more than was allowed by the Wigan Gas Act. The question in his mind was whether it was not too high a maximum. He thought that if the corporation authorized the committee to treat with the out-townships, some of the opposition might be done away with.

Mr. HILTON asked if it was compulsory under the Act that the out-townships should be supplied with gas from Wigan.

The TOWN-CLERK read the list of townships which the Wigan Gas Act provided should be supplied, including all or nearly all those comprising the Wigan Union. He understood, however, that they had now no control over Hindley.

The resolution was then put and carried.

Mr. H. WOODCOCK moved a formal resolution in the terms of the recommendation of the committee for carrying out the purchase, which was seconded by Alderman BYROM, and carried unanimously.

Mr. WOODCOCK suggested that instead of the payment of the purchase-money in full, the shareholders in the gas company should be offered permanent corporation stock at 4½ per cent. interest.

The TOWN-CLERK said this was a special meeting, and the remarks which Mr. Woodcock had been good enough to make must be considered at a meeting called for the purpose. At present he did not think the corporation had power to create permanent stock, but in the bill which would be brought before Parliament they were applying for that power, and before the corporation bound themselves to pay at the rate of 4½ per cent. he begged to inform them that the Government had the power to let them borrow money at 3½ per cent. If they could borrow money on the latter terms for the purchase of the gas-works it would be a great saving. Whether or not the Government would lend them the money for this purpose they did not know; the only question with them was whether they should ask.

A special meeting of the company is called for the 2nd proximo, to consider the propriety of disposing of the works, and the terms provisionally agreed to for their purchase.

The Pemberton and Ince Local Boards have held meetings during the past week, and passed resolutions to oppose the Wigan Improvement Bill, especially those parts which relate to the purchase of the gas-works.

At a public meeting of the ratepayers of the Orrell district, held at the Local Board offices, on Thursday, it was resolved not to oppose the bill.

The question was discussed at a ratepayers meeting at Aspull on the 16th, and a strong feeling expressed in opposition. It was eventually resolved to call a special meeting thereon on the 4th proximo.

CHATHAM AND ROCHESTER WATER-WORKS COMPANY.

The Half-Yearly Meeting was held on the 17th inst.—Mr. J. BAIRD in the chair.

The report, which was read by Mr. Heckford, the secretary, stated that the £300 written off law, parliamentary, and engineering charges during the past half year was the last instalment on that account with which the revenue of the company would be debited, the whole amount known as preliminary expenses being now paid off and discharged. When it was remembered that during the last two years the company had had to contend against a large increase of local taxation and an extraordinary rise in the price of coals, materials, and labour, the final extinguishment of these expenses under such adverse circumstances was so much the more satisfactory, and the directors congratulated the shareholders upon at length being able to accomplish this long-desired end. In consequence of the great increase in the cost of coals, &c., before referred to, and with a view to some extent to meet it as far as practicable, the directors found it necessary to revise the company's scale of charges for water supplied to consumers by meter. They therefore communicated with a considerable number of the water companies in the kingdom, and obtained copies of their respective scales of charges for water sold by meter, when, upon comparison, it was found that this company's scale was much below that in use by the most important of the companies applied to. The directors therefore, after carefully considering what would be a proper scale of charges to apply, decided to adopt that of the corporation of Manchester, commencing at 30,000 gallons up to 285,000 gallons per quarter. The new scale came into operation on the 1st of January last, and the company would at once obtain the benefit of the increased rate which would henceforth be charged to consumers taking water from the company by meter. The directors had also the power, under the company's special Act, to increase the rates for water supplied for domestic purposes, but they had not thought it advisable at present to make any alteration in this respect, except in some few special cases.

The statement of accounts showed that £41,700 had been received on capital account, the whole of which had been expended. The revenue account showed that the sum of £4367 had been received from water-rate for the past half year, leaving, after the payment of the last instalment of £300 for preliminary expenses, £479 for salary and wages; £340 for rent, rates, and taxes; and £1125 for coal and oil—a balance profit of £1151, which would enable the directors to declare a dividend at the rate of 6 per cent. per annum. The reserve-fund now amounts to £2674.

The report and accounts were adopted, the dividend declared, the retiring directors and auditor re-elected, and the proceedings closed with the usual votes of thanks.

THE NORTHERN COAL TRADE.

(FROM OUR OWN CORRESPONDENT.)

The coal trade of the north-eastern district of England showed very little improvement last week upon the dull business of the week that went before it. February is likely to close without any symptoms of a reaction from the depression which has prevailed in this trade since the 1st of January. Coalowners are now looking to the opening of the spring business in the middle of March, with the hope that it will cause an improvement in the tone of the coal market. At present, in the gas, steam, and manufacturing coal trades, the coal offices are inclined to take lower prices for immediate delivery in preference to orders extending over a series of months. Another private meeting of owners of leading steam collieries was held in Newcastle on Friday, to consider the state of the trade, but nothing has transpired as to the conclusions they arrived at. Outside pits are selling a very fair class of steam coals at 17s. per ton, and at the same time the Scotch coalowners are reported to be delivering steam coals on board of ship in Leith Harbour at 14s. per ton, and Welsh coals are selling at lower prices in Cardiff than they were a few months ago. The steam coalowners are holding out stiffer than any other for quoted prices. It is difficult to see, however, how they can be maintained, looking at the downward tendency of the coal markets; and it is thought that they will ultimately have to follow the course of trade, and submit to lower terms. In the meantime, very many of the collieries are making broken time, and are restricting the output very considerably; but, notwithstanding this arrangement, there is a tendency to an accumulation of stock. Freights are exceedingly scarce on Newcastle Quay, and the supply of tonnage is decidedly in excess of the demand. The dispute between the North-Eastern Railway Company and their trimmers and teemers at the Tyne Dock remains unsettled, and in consequence the shipment of gas coals in this dock is a good deal impeded, and there is a detention of steamers in loading. The chemical manufacturers of the Tyne have gone upon short time. They have determined to work no more than two-thirds of their production. The consequence of this is that workmen are being paid off. The iron trade is without much change. Prices are somewhat lower, and the general tone of business is flat. The only activity that there is upon the Tyne is in the manufacture of marine, locomotive, and colliery engines. The Newcastle engine-shops continue very full of work.

CHEMICAL, MINERAL, AND METAL REPORT,

For the Week ending Feb. 21, 1874.

(*From Messrs.* BERGER SPENCE AND CO.'S *Circular.*)

Chemicals.—There have been no changes worth noticing in the alkali list of prices this week. Soda crystals have been rather firmer, and all the other products for the most part remain unchanged. Bleaching powder slightly easier. The agricultural department may be considered as an exception to the general condition of the trade. The spring demand is creating a considerable amount of activity, for which both makers and merchants are duly prepared. Prices so far have not materially altered, but the feeling is good, and advanced figures seem not improbable, after a clearance under former home sales has been effected.

Minerals.—This week the demand for minerals has not increased, and the market remains much the same as before reported. There is a downward tendency in the value of coal, and quotations are only exceptionally adhered to. In some cases prices are decidedly lower than they were a month ago, and without exception several shillings less per ton than at this time last year. The supply is gradually becoming more abundant, and even causing an amount of weakness which producers may accept as an unpreventible effect.

Metals.—There is not much stirring in this market; prices have again been lowered, but without avail to stimulate fresh business, and operators are now anxiously looking forward to the opening of the spring trade, when it is hoped the demands for shipment may produce some of that animation which is now so greatly needed by all interested in metals. Scotch pig iron warrants have experienced a further and very considerable reduction, and makers iron has also had to follow suit. The shipments for the past week are returned as 7138 tons, against 8050 tons in the corresponding week of last year. There is considerable latitude in the quotations now given for Middlesborough pig iron, for whilst some makers and merchants are willing to sell at very low prices, other smelters are adhering firmly to full quotations, which they anticipate to be able to realize shortly. There is little doing in manufactured iron, and prices are easier for some descriptions. A fair number of sales are taking place in Chili bar copper, and a moderate business is doing in English, at unaltered rates. There is no change in the value of tin, but the tone is steadier. The legitimate demand for lead is keeping the smelters fairly supplied with orders, and although late complications might have seriously depressed this metal, they have not done so to any great extent, and present quotations may be taken to represent its actual value. Spelter continues quiet. Quicksilver again dearer.

SUFFOCATION BY GAS AT CLERKENWELL.—An inquest was held on the 18th inst., by Dr. Lankester, coroner for Central Middlesex, on the bodies of George M'Leod and Martha Furneaux, who were found dead in an ante-room of the Clerkenwell mortuary on the 16th inst. The man had been an inmate of the workhouse since December last, and was sent out on Sunday afternoon, by the porter of that establishment, with a message to the coroner's officer, but never returned. The woman was a widow, and had been, but was not at the time of her death, an inmate of the workhouse. She had formed an intimacy with M'Leod, and used to meet him at the mortuary. She resided with her sister, and was last seen by her on Sunday, when she appeared in good health. Davis, the coroner's officer, stated that on the Monday afternoon he went to the mortuary, and found the ante-room locked on the inside, the key being in the lock. With assistance the door was burst open, when the deceased woman was found lying on her side, and a dog, the property of the master of the workhouse, close to her. The man was lying on a form. The gas-stove, which contained several jets, was alight, as also was the gas-burner. The coroner said he noticed a strong smell of gas, and his first impression on the Monday was that the carbonic acid generated in the room had extinguished the lights, and that the escape of gas from the burners had still gone on. Davis said he was positive the gas was alight. The window, which was a large one, was shut quite close. He saw nothing in the room to lead him to suppose that the deceased had been drinking. Dr. H. Brown said he was called to the mortuary at about half-past three on Monday afternoon, and at that time the gas was extinguished, but the room was strongly impregnated with gas. The dog breathed after he arrived, and some water had been thrown over it. Under the window, lying on the floor, was the woman, with her face on a mat—partly on her left side. Her eyes were greatly suffused, and there was a discharge from the mouth and nose. The man was on a bench, with his head pendant, and his feet touching the ground. There were no marks of violence on the bodies, and nothing to denote poison. The cubic capacity of the room was between 1500 and 1600 feet, which, under ordinary circumstances, would have been plenty of room for two persons. In his opinion they had both been asphyxiated by the collection of noxious gases, for which there was no escape except by the key-hole and the chink under the door, which in this instance had doubtless only admitted sufficient air to keep the gas burning. After some further evidence as to facts had been given, the coroner summed up, and said it was evident that the room in which the unfortunate deceased had locked themselves was not sufficiently ventilated for the quantity of gas which was burning, and that, therefore, carbonic acid accumulated; whilst the escape of gas, of which there could be no doubt, would account for the presence of carburetted hydrogen, which would contribute to death. He could conceive no other cause for death. If, however, they should be of opinion that the man administered poison to the woman and afterwards to himself, the case would assume a grave importance, and he would adjourn the inquiry in order that a *post mortem* examination might be made. As a juryman had remarked, it was not likely he would have poisoned the dog if he had himself, and therefore he invited them to accept the opinion of the medical man, that these persons had lain down to sleep, and that they had been killed subtlely and slowly by the accumulation of poisonous gases. The jury, after a brief deliberation, found that the deceased persons died from the poisonous effects of the fumes of carbonic acid and carburetted hydrogen gases, and that the deaths arose from accidental causes.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

565.—HAZELDINE, F., Borough, Surrey, "An improved valve or tap for liquids and other purposes." Feb. 14, 1874.

566.—BOX, W. W., Gas-Works, Crayford, Kent, "Improvements in apparatus used in the manufacture of gas." Feb. 14, 1874.

567.—RICHARDS, W., Brixton, Surrey, "Improvements in regulating the supply of fluids and liquids for the manufacture of illuminating gas, and for the apparatus employed therein." Feb. 14, 1874.

589.—HENRY, W., Leicester Square, London, "Improvements in lighting and heating with carburetted hydrogen gas." Feb. 17, 1874.

598.—YARROW, E. H., Camberwell, Surrey, "Improvements in the manufacture of gas, and in the apparatus connected therewith." Feb. 17, 1874.

601.—M'BEATH, C., South Cobbinshaw, Edinburgh, "Improvements in retorts and apparatus connected therewith." Feb. 18, 1874.

605.—ABEL, C. D., Southampton Buildings, London, "Improvements in gas-motor engines." A communication. Feb. 18, 1874.

622.—SIEBERT, O., New York, U.S.A., "Improvements in gas-light apparatus." Feb. 19, 1874.

629.—LEONI, S., New North Road, London, "Improvements in heating and cooking apparatus." Feb. 19, 1874.

641.—HOLLAND, H., Birmingham, "Improvements in the manufacture of gas for illuminating and heating purposes." Feb. 19, 1874.

GRANTS OF PROVISIONAL PROTECTION.

485.—HARROP, J. J., Manchester, "Improvements in the manufacture of tin-lined lead piping, and of tin and lead piping, and of soil and water pipes." Feb. 6, 1874.

488.—KAYSER, C. W., Sheffield, "Improvements in or connected with steam, pumping, or water engines." A communication. Feb. 6, 1874.

499.—UNDERHAY, F. G., Clerkenwell, Middlesex, "Improvements in bib-cocks or cocks for drawing off water." Feb. 7, 1874.

500.—EVERETT, G. A., New York, U.S.A., "Improvements in liquid-meters." A communication. Feb. 7, 1874.

506.—ATKINS, F. H., Fleet Street, London, "Improvements in filters." Feb. 9, 1874.

534.—WILSON, M., Brixton, Surrey, "Improvements in stench-traps." Feb. 11, 1874.

NOTICES TO PROCEED.

3264.—GARDNER, H., Holloway, Middlesex, "Improvements in treating air for the production of hydrocarbon gas, and in apparatus or appliances therefor." A communication. Oct. 8, 1873.

3308.—NEWTON, H. E., Chancery Lane, London, "An improved mode of connecting gas, water, or other pipes." A communication. Oct. 11, 1873.

3314.—MANWELL, J., Glasgow, "Improvements in charging horizontal retorts, and in apparatus therefor." Oct. 13, 1873.

167.—HEARSON, C. E., Bedford Row, Middlesex, "Improvements in Argand burners for burning coal gas or other illuminating gas, and animal, vegetable, and mineral oils." Jan. 13, 1874.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

2728.—SMYTH, J. F., Belfast, "Improvements in apparatus for the manufacture of gas." Aug. 18, 1873.

2779.—LAKE, W. R., Southampton Buildings, London, "Improvements in apparatus for the production of light from benzine, naphtha, and other like substances." A communication. Aug. 21, 1873.

2842.—WALSH, W. J., Birmingham, "Improvements in gas-lamps." Aug. 28, 1873.

2889.—GREEN, H., Preston, and BARROW, J., West Gorton, near Manchester, "Improvements in effecting the ignition of gas, and apparatus and means for opening the supply of gas to burners, for igniting the gas, and for extinguishing gaslights." Sept. 2, 1873.

Share List,
OF
Metropolitan Gas and Water Companies.

(*Corrected by Mr.* F. N. GOLDING, *Sun Court, Cornhill, from the latest Stock Exchange Quotations.*)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Latest Quotations.
	£	GAS COMPANIES.	£ s. d.	£ s. d.	£
8000	20	Anglo-Romano	20 0 0	10 0 0	14 — 16
5000	20	Bahia (Limited)	20 0 0	3 0 0	11 — 13
1000	20	Do., preference	20 0 0	10 0 0	25 — 27
750	20	Do., do., redeemable	20 0 0	10 0 0	20 — 22
40000	5	Bombay (Limited)	5 0 0	6 15 0	5⅞ — 6¼
10000	5	Do., fourth issue	4 0 0	6 15 0	⅛—1 pm.
10000	20	British (Limited) (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge., and Holywell.)	20 0 0	10 0 0	34 — 36
7500	20	Cagliari (Limited)	20 0 0	7 0 0	15 — 17
180000	10	*Chartered* A ordinary	10 0 0	10 0 0	15¼ — 15⅞
25000	10	Do. A, 5 per cent. preference	10 0 0	5 0 0	13½ — 14
20000	10	Do. A, 2 per cent. preference	10 0 0	5 0 0	13¾ — 14
30000	10	Do. A, 3 per cent. preference	10 0 0	5 0 0	
10000	10	Do. B, 4 per cent. maximum	10 0 0	4 4 0	7 — 7½
20000	10	Do. C, 10 per cent. preference	10 0 0	10 0 0	19½ — 20
12000	25	Do. D, 10 per cent. preference	25 0 0	10 0 0	48½ — 49½
443875	Sk.	*Commercial*	100 0 0	10 0 0	158 —160
20000	20	Continental Union	20 0 0	8 0 0	20½ — 21½
20000	20	Do., new	12 10 0	8 0 0	⅛—1 pm.
10000	20	Do., preference (Grmny.: Strsbg. France: Cette, Nismes, Montargis Vienne, Roanne, Beaucaire, Rueil, Albi. Italy: Milan, Genoa, Parma, Modena, Alessandria, Messina.)	20 0 0	7 0 0	24 — 26
5000	10	*Crystal Palace District*	10 0 0	10 0 0	15½ — 16
5000	10	Do., preference	10 0 0	6 0 0	11¼ — 12
1000	10	Do., new shares	10 0 0	7 0 0	11½ — 12
23406	10	European (Limited)	10 0 0	8 0 0	17 — 18
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	7 10 0	8 0 0	6 — 7
4054	10	Foreign and Colonial (Limited)	10 0 0	..	9 — 10
5000	10	Hong Kong (Limited)	10 0 0	10 0 0	13¼ — 13⅞
1560000	100	*Imperial*	100 0 0	10 0 0	160 —162
78000	12½	Do., new shares	12 10 0	7 0 0	15¼ — 15⅞
2600	12½	Do.	5 0 0	7 0 0	6½— 6⅞
1300	100	Do., bonds	£100	10 0 0	195 —200
56000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwerp, Bordeaux, Brussels, Frankfort-on-Maine, Haarlem, Stolberg, and Vienna.)	43 15 0	9 2 6	53 — 54
3000	40	*Independent*	40 0 0	10 0 0	64 — 66
3000	10	Do.	10 0 0	5 0 0	8 — 9
3000	20	Do.	20 0 0	7 10 0	24½ — 25½
4500	10	Do., D	3 0 0	10 0 0	7⅞— 8½
378350	Sk.	*London*	100 0 0	10 0 0	158 —160
150000	Sk.	Do., 1st preference	100 0 0	6 0 0	117 —120
14450	Sk.	Do., 2nd preference	100 0 0	6 0 0	
4350	Sk.	Do., 3rd preference	100 0 0	6 0 0	
7622	25	Do., A shares	12 10 0	6 0 0	
263050	All	Do., Debenture stock	100 0 0	5*l.* & 6*l.*	
15000	5	Malta and Mediterranean (Limited)	5 0 0	5 0 0	2½— 2⅞
6000	5	Do., preference	5 0 0	7 0 0	5 — 5½
20000	5	Mauritius (Limited)	2 0 0	7 0 0	2 — 2⅛
25000	20	Monte Video (Limited)	20 0 0	..	23½ — 24½
8000	10	Nictheroy, Brazil (Limited)	10 0 0	..	
30000	5	Oriental (Calcutta)	5 0 0	9 0 0	6½— 7
30000	5	Do., new shares	2 10 0	9 0 0	⅞— 1⅛
10000	5	Ottoman (Limited)	5 0 0	nil.	1½— 2½
17500	10	Pará (Limited)	10 0 0	7 0 0	7 — 8
27000	20	*Phœniz*	20 0 0	10 0 0	32 — 33
360000	100	Do., new	55 0 0	7 10 0	69 — 71
144000	Sk.	Do.	100 0 0	5 0 0	92 — 94
5000	20	*Ratcliff*	20 0 0	10 0 0	31½ — 32½
36000	20	Rio de Janeiro (Limited)	20 0 0	10 0 0	32½ — 33½
7359	5	Singapore (Limited)	5 0 0	7 10 0	4½— 5
2000	5	Do., preference	5 0 0	7 10 0	5½— 6
1500	32½	Shanghai	32 10 0	12 0 0	30 — 32
4000	50	*South Metropolitan*	50 0 0	10 0 0	85 — 87
4000	12½	Do.	12 10 0	10 0 0	20½ — 21½
20000	12½	Do., new shares	5 0 0	10 0 0	9½ — 10½
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15½ — 16
10000	10	Do., new	7 0 0	10 0 0	4½ — 5½
9000	4	United General (Limerick)	4 0 0	2 10 0	2 — 2½
1500	10	*Wandsworth and Putney*	10 0 0	10 0 0	14 — 15
1500	10	Do.	10 0 0	7 10 0	11 — 12
2957	10	Do.	10 0 0	7 0 0	
933	10	Do.	3 0 0	7 0 0	
16000	5	*West Ham*	5 0 0	10 0 0	7⅞ — 8
10000	5	Do., new shares	2 10 0	10 0 0	— 4
		WATER COMPANIES.			
60000	10	Berlin	10 0 0	11 10 0	20 — 22
12000	100	Chelsea	100 0 0	6 0 0	118 —120
1500000	100	East London	100 0 0	6 0 0	120 —122
4000	50	Grand Junction	50 0 0	8 10 0	74—76 xd.
8840	25	Do., ¼ shares	25 0 0	8 10 0	36½ — 37¼
4760	25	Do., new do.; maximum dividend, 7½ per cent.	25 0 0	7 10 0	31 — 33
4396	100	Kent	100 0 0	6 0 0	121 —123
5339	100	Lambeth	100 0 0	6 5 0	120 —122
1161	100	Do.	20 0 0	6 5 0	
442	100	New River	100 0 0	8 0 0	
4443	100	Do.	30 0 0	8 0 0	36 — 38
400000	100	Do., debenture stock, 4 per cent.	100 0 0	4 0 0	97— 99
3036	100	Southwark and Vauxhall	100 0 0	5 10 0	98— 100
1296	100	Do., preference stock	100 0 0	5 0 0	101— 103
	100	Do., D shares	100 0 0	5 10 0	98— 100
		Do.	..	4 10 0	
	100	Do., new ordinary	..	4 10 0	
1600	100	Do., new ordinary, No. 1	40 0 0	4 10 0	
12172	61	West Middlesex	61 0 0	£6 per sh.	119—121

W. T. ALLEN & CO.,

(LATE TURNER & ALLEN,)

201, UPPER THAMES STREET,

London,

GAS & WATER ENGINEERS.

CONTRACTORS FOR THE SUPPLY OF

LAMP COLUMNS, LANTERNS,

FOUNTAINS, PIPES, &c.,

TO

GAS, WATER, & RAILWAY COMPANIES, LOCAL BOARDS, SHIPPERS, &c.

A Volume of the Newest Designs, with Price Book, forwarded on receipt of 10s.

GAS COAL
AND
HOUSE COAL.

For prices, including Waggon Hire and Railway Rate to any Station or Shipping Port, apply to

MR. PLEVINS,
MONKWOOD COLLIERIES,
NEAR
CHESTERFIELD.

NOTE.—Quotations given for the small, which for Gas and Coke results is equal to the large.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

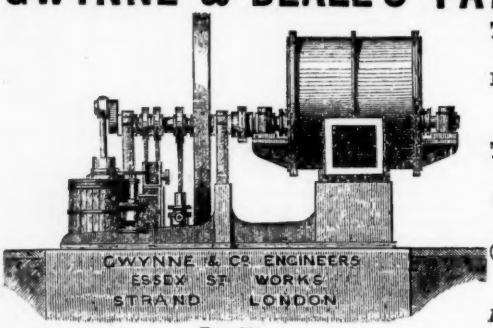


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

Mr. BEALE,

The oldest Maker, Inventor and Patentee of GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

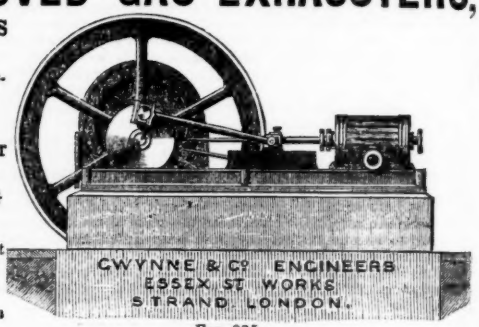


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

LOUGHBOROUGH GAS COMPANY.

WANTED, a Captain Stoker. Wages 28s. per week.

Apply to J. B. BALL, Manager, Gas-Works, LOUGHBOROUGH.

Feb. 20, 1874.

TO GAS FOREMEN.

WANTED, for a Gas-Work abroad, a thoroughly competent GAS FOREMAN.

Address, with terms and references, to SECRETARY, British and Foreign Water and Gas Works Company, Limited, BARTHOLOMEW HOUSE, E.C.

WANTED, a re-engagement as Working MANAGER of a small Gas-Work. Thoroughly understands the whole routine of a Gas-Work. Satisfactory references can be given as to character and ability.

Address S. E., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Assistant Gas ENGINEER or SUPERINTENDENT of a Gas-Work. Advertiser is of active business habits, a good draughtsman, and experienced in every department of works.

Address E. H., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, who is leaving a London Company, a re-engagement as CARBONIZING FOREMAN, or other suitable employment.

Address D. J., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a thorough practical Indoor FOREMAN in the gas-fitting and general brass finishing trade. He must be capable of making rough sketches and the general superintendence of a manufactory.

State full particulars as to last employment, salary required, &c., to B. F., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED.—The Directors of the Belper Gas and Coke Company require the services of a MANAGER for their works. He must be thoroughly conversant with the manufacture and distribution of gas, setting retorts, main and service laying, and the general routine of a Gas-Work, together with the book-keeping and collection of accounts from the consumers. He will be required to devote the whole of his time to the duties of his office, and give security to the amount of £200.

Applications, enclosing testimonials and references, stating age, where at present employed, and salary required, addressed to the Chairman, must be sent in to me at the Gas Company's Offices, on or before the 9th day of March next.

W. B. WHITAKER, Manager.

Feb. 17, 1874.

COOKING AND HEATING BY GAS,
BY
MAGNUS OHREN, A.I.C.E.

GAS *versus* COAL.

Pamphlet for Gas Companies to circulate amongst their gas consumers to increase day consumption, &c.

Specimen Copy by post 4d., direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

VINCENT'S
PATENT IMPROVEMENTS
IN
Apparatus for Manufacturing Gas.

Particulars to be obtained by application to—

MR. LAYARD JONES,
ENGINEER,
25, OLD BROAD STREET, LONDON, E.C.

GAS.

WANTED, in an old and improving business in a market town near to Birmingham, an energetic man as SECRETARY and BOOK-KEEPER by double entry. The make is about 9 millions per annum. He will be entrusted with the sole management, and must be well up in the manufacture and distribution of gas, and the details as to fitting, &c.

State terms and other particulars to G. C. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS-FITTERS.

A THIRD FITTER is required by the Sao Pedro (Brazil) Gas Company, Limited.

Applications, stating previous employment, age, whether single or married, and salary required, together with testimonials, to be sent at once to the Office of the Company, 60, GRACECHURCH STREET, E.C.

Feb. 19, 1874.

THE Galway Gaslight Company invite TENDERS for setting FOUR BEDS of CLAY RETORTS, five retorts in each oven.

For further particulars apply to the MANAGER at the works, Queen Street, GALWAY, or to Mr. M. J. TIERNEY, Secretary.

SECRETARY OR CLERK TO A GAS OR OTHER COMPANY.

THE Advertiser is desirous of an en- gagement as above. He has 12 years unexceptionable references, is practically acquainted with the office work of a Gas Company, and companies business generally under the Companies Acts or Special Acts. Can give security. Has no objection to go to a Colony. Copies of references will be forwarded.

Address S. M. S., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

SEVERAL Good Retort Setters Wanted For steady, good hands, constant employment.

Apply, by letter only, enclosing testimonials as to competency and sobriety, to L. D., 3, Wyndham Street, BRYANSTON SQUARE, W.

GASHOLDER FOR SALE.

THE Lanark Gas Consumers Company, Limited, invite OFFER for the purchase of a single GASHOLDER, 50 ft. by 18 ft. (erected new 12 years ago), with five columns, girders, 6-in. inlet and outlet pipes, 8-in. regulator-valve, and 150 yards of 8-in. pipes.

Also a HYDRAULIC MAIN, 18 in. diameter, in three lengths of 6 ft. 6 in. each, flange joints, with 4-in. flange dips, and 6-in. outlet top and end. Two standards.

The Directors will not bind themselves to accept the highest or any offers.

TO GASHOLDER MAKERS.

TENDERS required for new Gasholder, 26 ft. by 14 ft., with counterbalance, inlet and outlet pipes, valves, foundation bolts and plates. Top sheets, 12 gauge; side sheets, 14 gauge.

TO GAS-METER MAKERS.

WANTED, a thoroughly competent Man to Repair wet and dry Gas-Meters. Accustomed to use test holder. State wages required, where last employed, with references, to the undersigned.

Particulars to be obtained from, and offers sent to,

L. MONK, Manager.

Gas-Works, Lanark, N.B., Feb. 23, 1874.

WANTED to purchase, 5000 to 10,000 tons of GAS COKE. Waggons can be sent to any station for any proportion of above.

Address G. J. EVESON, Gas Coal and Coke Merchant, STOURBRIDGE.

GAS Companies or Owners of Gas-Works wishing to LEASE their works to pay a FAIR DIVIDEND, will oblige by sending particulars, addressed to A. B., care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

ON SALE, a Purifier, 8 ft. by 3 ft. 10 in. by 2 ft. 7 in., with iron grids and 6-in. connexions.

Also five Thorncloe's PATENT VALVES, 8 in., all in good condition.

Apply to the Oakengates Gas Company, SALOP.

STATION-METER.

THE Directors of the Warrington Gas Company have for sale a STATION-METER by West and Gregson, capable of passing 20,000 cubic feet per hour. Complete with clock, tell-tale, water-gauge and regulator, valves, bye-pass, and connexions. Discontinued in consequence of being too small.

Apply to JAMES PATERSON, Engineer.

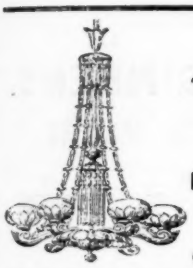
Warrington, Feb. 9, 1874.

ALFRED WILLIAMS,
PHŒNIX FIRE-BRICK WHARF,
64, BANKSIDE, SOUTHWARK, LONDON, S.E.

GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
AND FOR THE
SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,
AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.

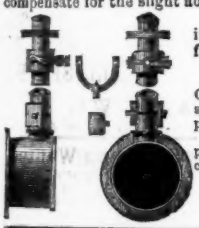
GEORGE ORME & CO.,
GAS-METER MANUFACTURERS, BRASSFOUNDERS & FINISHERS,
ATLAS METER-WORKS, OLDHAM.

CONSUMERS WET & DRY GAS-METERS ON THE MOST APPROVED PRINCIPLES.
STATION-METERS, GOVERNORS, PRESSURE-REGISTERS,
And every Description of Gas Apparatus.
GAS, STEAM, AND WATER FITTINGS.



F. & C. OSLER,
45, OXFORD STREET, LONDON, W.
MANUFACTORY AND SHOW-ROOMS:
BROAD STREET. BIRMINGHAM.
ESTABLISHED 1807.
MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

BOX'S PATENT ASCENSION-PIPES.
By the adoption of the improved ascensions and joints the trouble and annoyance of "jumping" stopped pipes is entirely obviated, while the time and labour saved will in a very short time amply compensate for the slight additional expense entailed in fitting them to existing apparatus.



In support of his own experience as to the advantages to be derived from the invention, the patentee has the pleasure to submit the following testimonial from the Engineer of the Phœnix Gas Company:—

Phœnix Gaslight Company, Bankside, S.E., Engineer's Office, Dec. 19, 1873.

DEAR SIR,—I have fitted about 20 ascension-pipes at the Vauxhall Station of this Company with your patent joints, I am thereby enabled to remove the pipe when it is stopped and substitute a clean one in about ten minutes, cleaning out the obstructed pipe at leisure.

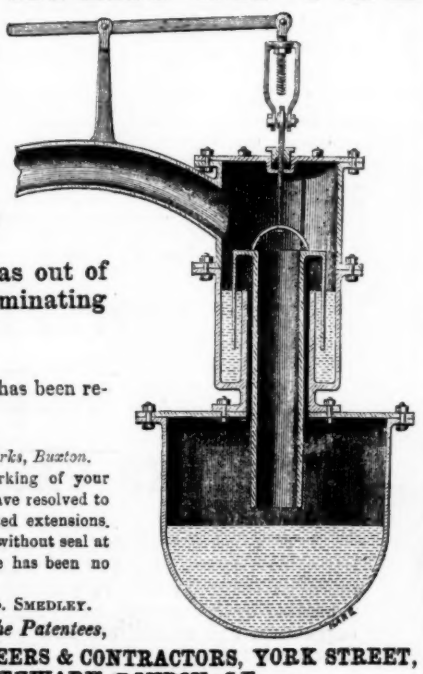
Until the happy time arrives when we can remove the necessity for "jumping" pipes at all, your joints will afford considerable relief. I trust your neat and ingenious contrivance will meet with the success it deserves. Yours faithfully,

Mr. W. Box, Crayford Gas-Works. C. WOODALL.

For terms and further information, apply to
W. BOX, GAS-WORKS, CRAYFORD, KENT.

CHANDLER'S PATENT DIP-PIPE

The advantages are—
1st, There is no pressure on the Retorts.
2nd, No deposit of Carbon.
3rd, No scurfing required.
4th, Never a choked Ascension Pipe.
5th, Saves Fuel and Wear and Tear.
6th, Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7th, Is never out of order.



The following (among other letters) has been received:—

Messrs. Chandler and Sons.

Manager's Office, Gas-Works, Buxton.

Gentlemen,—I am so satisfied with the working of your Patent Dips during the last five months that I have resolved to recommend the adoption of them in our proposed extensions. I find it under perfect control to work with or without seal at pleasure, and that during the whole time there has been no deposit of carbon.—Yours, &c.,

Jan. 21, 1874. GEO. SMEDLEY.

For terms of use and cost, apply only to the Patentees,
Messrs. CHANDLER & SONS, ENGINEERS & CONTRACTORS, YORK STREET, LONDON ROAD, SOUTHWARK, LONDON, S.E.

MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS.

The SEVENTEENTH QUARTERLY MEETING of the above will be held at the Mitre Hotel, Manchester, on SATURDAY, Feb. 28, 1874, at Three o'clock p.m., prompt.

Paper on "Gas Manufacture," by Mr. LONGWORTH, Gas Engineer, Dukinfield.—Adjourned Debate.

Paper on "Some Results Derived from the Use of Horizontal Condensers," by Mr. GRAHAM, Gas Engineer, Stalybridge.

COMMERCIAL GAS COMPANY.—

NOTICE is hereby given that the next ORDINARY MEETING of the Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on FRIDAY, the 10th day of April next, at Twelve o'clock at noon, to receive the Report of the Directors, and to declare a Dividend to the 31st day of December last.

The Directors going out of office are Richard Bradshaw, William Christie, Alexander Thomas Laport, Esqrs., and, being eligible, offer themselves for re-election.

Edward Marsh, Esq., auditor, will go out of office, and, being eligible, has given notice of his intention to offer himself for re-election.

The Books of the Company will be closed for the Transfer of Stock from the 25th day of March to the 10th day of April now next ensuing.

By the Company's Act of Incorporation, the holders of Stock can inspect the Books of the Company during one fortnight before and one month after the Meeting.

By order of the Board,
GEORGE JAQUES, Secretary.

Stepney, Feb. 14, 1874.

CORPORATION GAS-WORKS, BARROW-IN-FURNESS.

FOR SALE—A set of Four Dry Lime

PURIFIERS, 8 ft. square, four layers (wood sieves) in each, galvanized iron covers, hydraulic centre-valve, with 9-in. connexions, and lifting crane complete.

Also TWO CAST-IRON SCRUBBERS, 18 ft. high by 4 ft. diameter, top platform, with wrought-iron railings, wrought-iron ladder, 9-in. connexions, including four Donkin's valves complete.

The above are in good working order, and are only disposed of in consequence of enlargement of works.

For particulars, apply to JOHN LEWIS, Manager.

Feb. 5, 1874.

TO TAR DISTILLERS AND OTHERS.

THE Stratford-upon-Avon Gas Company

are prepared to receive TENDERS for the whole of their GAS LIQUOR and surplus TAR to be disposed of from their works by boat or rail, from March 25, 1874, to March 25, 1876.

Tenders to be sent to the Manager, HENRY CRANMER, Gas-Works, STRATFORD-UPON-AVON.

Feb. 19, 1874.

TAR AND AMMONIACAL LIQUOR.

THE Macclesfield Corporation Gas Com-

mittee are prepared to receive TENDERS for their TAR and AMMONIACAL LIQUOR for a term of Three years.

The Tar, &c., to be removed from the works by the contractor.

Tenders to be in by the 1st of April, 1874.

For further information apply to the Manager.

The Committee do not bind themselves to accept the highest or any tender.

Feb. 16, 1874. JOHN HENRY LYON, Manager.

SHIPLEY GAS-WORKS.

TO IRONFOUNDERS, GASOMETER MAKERS, AND OTHERS.

THE Directors of the Shipley Gaslight

Company are prepared to receive TENDERS for the erection and completion of a TELESCOPE GASOMETER, 100 ft. in diameter, and 44 ft. in height, with 10 columns, girders, &c.

The drawings and specifications may be seen on application at the Office of the Company, Shipley, on and after Monday, the 2nd day of March, and sealed tenders must be sent, endorsed "Tender for Gasometer, &c.," on or before the 11th day of March, 1874, before Twelve o'clock at noon.

The Directors do not bind themselves to accept the lowest or any tender. By order of the Directors.

JOHN WILCOCK, Secretary to the Company.

SURPLUS PLANT FOR SALE.

TWO New Purifier Covers, 5 ft. 2 in.

square, 15 in. deep—by Porter and Co., Lincoln.

1 new Rack Valve, 8 in.

1 Rack Valve, 6 in. 1 Screw Valve, 6 in. Both three years in use.

1 Cast-Iron Cistern, 12 by 12 by 15, with 3-in. sockets.

1 Cast-Iron Cistern, 18 by 18 by 18, with 2-in. sockets.

2 Cast-Iron Cisterns, 12 by 12 by 15, with 3-in. sockets.

1 Connexion for Scrubber, with Flange, 17 in.

2 Tees, 6 in. by 5 in., flange and socket; 1 Tee, 6 in. by 6 in.; 1 Tee, 7 in. by 5 in.; 1 Tee, 7 in. by 2 in.

5 Bends, 6 in.; 1 Flange Bend, 6 in.; 3 Bends, 5 in.; 2 Bends, 4 in.; 1 Syphon complete, 5 in.; 2 Syphons complete 2 in.; 2 Double Sockets, 6 in.; 2 Double Sockets, 7 in.; 1 Double Socket, 9 in.

8 Wrought Tramway Rails, 12 ft. each.

Apply to Mr. T. H. BOUTTELL, Manager, Gas-Works, SLEAFORD.

TO CONTRACTORS AND OTHERS.

THE Directors of the Newcastle-upon-

Tyne and Gateshead Gas Company invite TENDERS for the construction of River Quay, Retort-House, Meter-House, Exhauster-House, Boiler-House, Purifying-House, and other works and apparatus required in the formation of the new Gas-Works at Redheugh, Gateshead.

Lithographed copies of the drawings and specifications may be had on application to the undersigned, at the Office of the Gas Company, Newcastle-upon-Tyne, on payment of £1 1s. for the general specification and 10s. each sheet for the drawings. The whole of the works need not form one contract, but contractors will be required to tender for each structure and for the ironwork separately.

Tenders to be addressed to the Directors and sent to the Company's Office not later than March 16, 1874.

The Directors do not bind themselves to accept the lowest or any tender.

WM. HARDIE, Secretary.

Gas Offices, Neville Street, NEWCASTLE-ON-TYNE,
Jan. 28, 1874.

CITY OF CARLISLE.

TO MANUFACTURING CHEMISTS AND OTHERS.
AMMONIACAL LIQUOR.

THE Carlisle Gas Committee are prepared to receive TENDERS for the AMMONIACAL LIQUOR to be produced at their works for One year from March 31, 1874, to March 31, 1875.

Particulars may be had on application to the Manager of the works, to whom tenders, endorsed "Tenders for Ammoniacal Liquor," are to be delivered, on or before March 26, 1874. J. HEPWORTH, Manager.

Gas-Works, Carlisle, Feb. 6, 1874.

THE Scarborough Gas Company, owing to the removal of their works, will have FOR SALE, about October, 1874, the following APPARATUS, the whole of which is in exceedingly good condition :—

Fittings for 140 Retorts, consisting of mouthpieces, ascension, saddle, and dip pipes, and hydraulic and foul mains.

A Condenser, consisting of 40 12-in. pipes, with top and bottom boxes, and inlet, outlet, and bye-pass valves.

Two Scrubbers, each 7 ft. diameter and 16 ft. high, with valves as before.

Two Purifiers, 8 ft. 6 in. square and 5 ft. deep, 20-in. water lutes.

Two Cast-iron Water-Tanks, respectively 24 ft. by 16 ft. by 4 ft., and 20 ft. by 8 ft. by 4 ft. New in 1865.

Two Horizontal Engines, 4 h. p., two single-flue Cornish boilers, and two 20,000 feet per hour Beale's Exhausters. All new in 1866.

One Station-Meter, by Milne, 0,000 feet per hour. New in 1864.

One Gasholder 80 ft. diameter, in two 24-ft. lifts. About 11 years old.

One Gasholder 50 ft. diameter, in two 22-ft. lifts. Only 4 years old.

Two Governors, by Parkinson, on 12-in. and 10-in. mains.

A considerable length of 10-in. Cast-iron Socket and other Pipes.

An inspection of the above Apparatus is requested by the Officers of Companies requiring enlargements or extensions, and offers to purchase will be duly considered.

By order of the Board,
JAMES MOON,
Manager and Secretary to the Company.

RICHARD THOMAS & CO.,
40, GRACECHURCH STREET,
Manufacturers of
EWELL FIRE-BRICKS, CLAY, AND CEMENT.
Warranted the best quality.
WORKS AT EPSOM.

RETORT SETTING & WORKING.
AN ILLUSTRATED PAMPHLET,
By E. S. CATHELS.
To be had of Mr. W. B. KING, 11, Bolt Court, Fleet Street, London. Price 2s. 6d., post free.

WORKING DRAWINGS AND SPECIFICATIONS
OF
CATHELS'S IMPROVED RETORT SETTINGS,
To be Heated by Coke, Tar, or Breeze.
For terms, apply to E. S. CATHELS, Gas-Works, Montreal, Canada.

GAS CONSUMERS MANUAL (Illustrated);
Or, HOW TO OBTAIN GOOD LIGHT & CHEAP GAS.
By E. S. CATHELS. Price 1s. 2d., post free.
LONDON: W. B. KING, 11, BOLT COURT, FLEET STREET, E.C.

BOUCK & CO., LIMITED,
MANUFACTURING CHEMISTS,
TAR AND AMMONIA DISTILLERS, &c.,
MILES PLATTING, MANCHESTER.
WM. LITCHFIELD, SECRETARY.

CONTRACTORS for the PURCHASE of GAS TAR AND AMMONIACAL LIQUOR,
Also of their products.

In the Press, and shortly will be Published, Second Edition, price 7s.,
THE
GAS MANAGER'S HANDBOOK
OF
TABLES, RULES, AND USEFUL INFORMATION.
By THOMAS NEWBIGGING, A.I.C.E.

The scope of this work is apparent from its title. The First Edition, published a year or two ago was eagerly sought for, and has been now for some time out of print. The favourable reception accorded to it sufficiently proved that it supplied a generally acknowledged want in the profession. The New Edition will be published in fcap. 8vo., morocco, gilt. The work has undergone careful revision; much new matter has been added; and its form altered to suit alike the pocket and the desk. Every effort has been made by the Editor to increase its usefulness and render it worthy of the position it aspires to fill—that of an indispensable companion for all persons engaged in gas making.

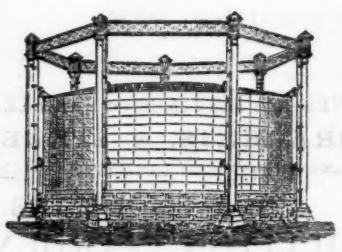
TO ADVERTISERS.

Space has been reserved for the insertion of a few Advertisements of Manufacturers, &c., at the following charges:—

A Whole Page	£3 3 0
Half a Page	1 15 0
Quarter Page	1 1 0

Orders to be sent to the Publisher,
WILLIAM B. KING,
11, BOLT COURT, FLEET STREET, LONDON, E.C.

SAM. CUTLER & SONS,
CONTRACTING GAS ENGINEERS,
GASHOLDER & GENERAL GAS APPARATUS MAKERS,
MANUFACTURERS OF
BOILERS, IRON ROOFING, IRON BRIDGES,
AND GENERAL IRONWORK.



S. C. AND SONS undertake Contracts of any magnitude for the Erection of new and Remodelling of existing Gas-Works, for Gasholders, Cast and Wrought Iron Tanks, Iron Roofs, and every description of Apparatus for the Manufacture and Distribution of Gas.

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WORKS FOR THE SUPPLY OF
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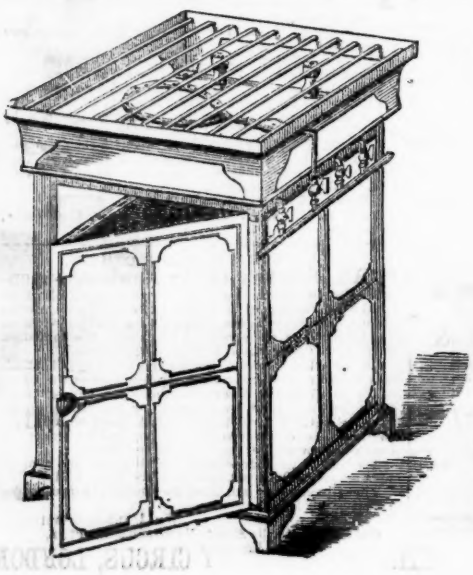
S. C. AND SONS undertake the Supply and Laying of Mains for Gas and Water, and supply all Castings, Connexions, and Fittings for Retort-House, Works generally, and for Streets. They also supply Valves of all descriptions, Iron and Clay Retorts, Hotpressed Retort-Lids, Steel Charging-Scoops of improved make, for which they have special machinery, Improved Coke and Coal Barrows, Cross-Bars and Screws, Bolts and Nuts, Furnace and Stoking Tools, Iron and Wood Purifier-Sieves, Lead, Yarn, Borings, &c., including every requisite whatsoever for a Gas-Work, a well-assorted stock being kept of those goods most in request.

SOLE MAKERS OF BRETT'S PATENT COKE BARROW.

Experienced Retort Setters sent to any part of the Kingdom.

Address: PROVIDENCE IRON-WORKS, MILLWALL, LONDON.



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GAS STOVES FOR COOKING,
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GAS HOT WATER APPARATUS
FOR CONSERVATORIES, &c.

GAS BATHS; GAS IRONING STOVES
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J. W. & Co. feel assured that the introduction of Gas Stoves, either by letting on hire or sale, is greatly to the interest of Gas Companies. The consumption of gas is thus very greatly increased, and the gas-works made profitable by day as well as by night. Many Companies have adopted this suggestion, and several are now paying us over £1000 per year for our Cooking Stoves.

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UNDER one or the other of their Patents, Machines can be adapted to almost any existing works without material alteration of the Retort-Houses or Settings.

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WITH TALC REFLECTORS AND SELF-ACTING VALVES

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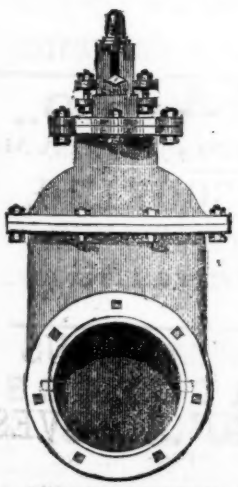


These solidly constructed double-faced Gas-Valves are superseding the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

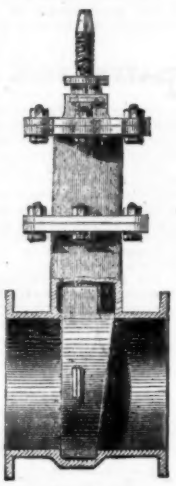
They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.



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Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.
To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.
To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

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MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.
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MANUFACTURE AND DISTRIBUTION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers: but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.
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DESIGNS and Plans of Gas-Works, Extensions and Alterations, Drawings and Tracings of Gasholders, Tanks, Retorts, Retort-House Fittings, Roofs, Girders, Condensers, Scrubbers, Engines, Boilers, Exhausters, Purifiers, Governors, Valves, &c., prepared with despatch, and at a moderate rate.
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BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.
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By simply mixing the foul lime with tar it is converted in the first instance into an excellent fuel. By burning this fuel a very valuable material for building purposes is obtained, which can be used either as lime or cement or plastic. When used as cement it will be found equal to the best Portland in durability and hardness.
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STREET-LAMP.
A great improvement on the old-fashioned 14-in. Lamps.
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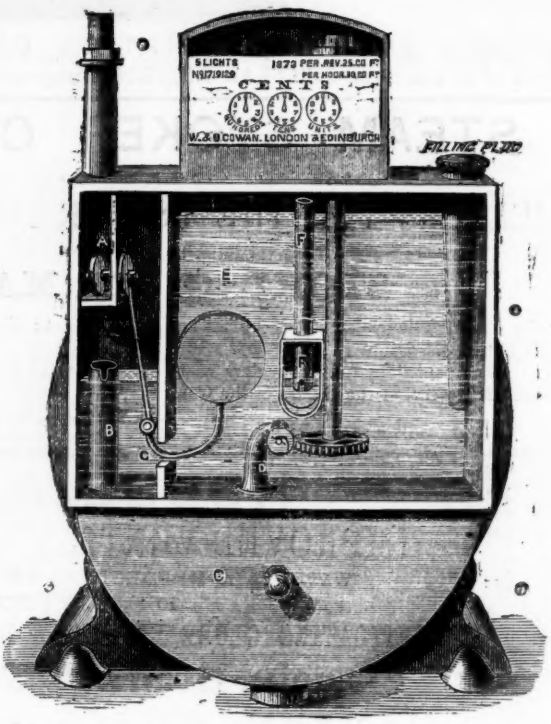
PATENT COMPENSATING GAS-METER,
IN TIN CASE, PATENT SIDE VALVE ARRANGEMENT.



DESCRIPTION.

The gas passes from the valve-box A by the overflow-pipe B into the waste water box C, and upwards through the spout D to the measuring drum; E is the compensating fountain, in which also is the float, the lever of which, passing through the hole G, opens and shuts the valve.

When the water level in the meter lowers, the *bottom end* of the air or gas tube F becomes unsealed, thereby admitting air or gas into the upper part of the fountain, which, causing water to pass through the hole G, restores the level in the meter, when this action ceases.

The float and valve are beyond the influence of either inlet or outlet pressure, and the fountain is large enough for a year's supply.

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WET AND DRY GAS-METER MANUFACTURERS,
(ESTABLISHED 1827,)

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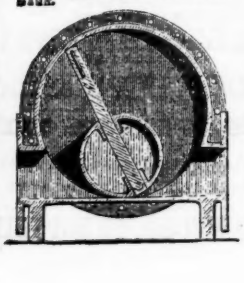
LONDON, N.

BUCCLEUCH ST. WORKS,
EDINBURGH.

TRADE MARK
J. BEALE'S
PATENT
GAS EXHAUSTER.



BEALE'S CONTINUOUSLY ACTING
GAS EXHAUSTERS
ARE NOW MANUFACTURED BY
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MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.
B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise, and Gas-Valves.
Estimates and Prices on application to
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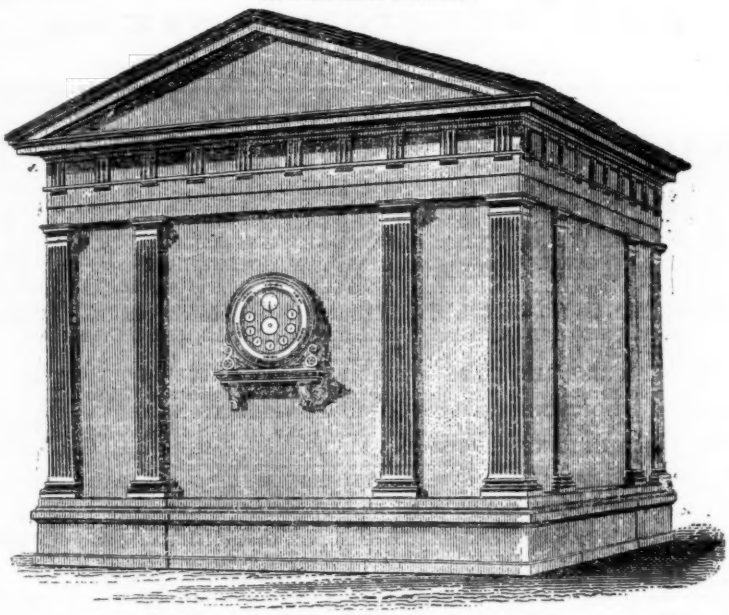
ROUND STATION-METERS,

ON CAST-IRON STANDS.



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WATER-METERS SUITABLE FOR ALL PRESSURES.

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STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

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Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

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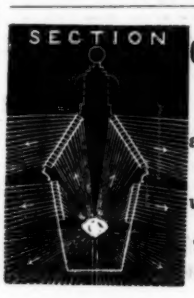

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Lists on application.

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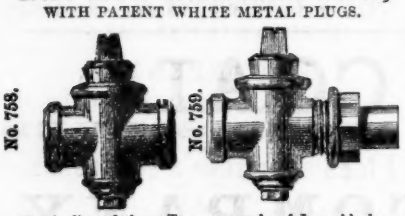
WITH PATENT WHITE METAL PLUGS.



The bodies of these Taps are made of Iron, black or galvanized, and the Plugs of Patent Metal. They are warranted not to set fast or corrode as do iron or brass Cocks, will always work easily, are strong, well made, durable, of little or no intrinsic value, and, therefore, not likely to be stolen; and the PRICES are (especially upon the larger sizes) FULLY 50 PER CENT. LESS THAN BRASS COCKS.
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IRON, BRASS, COMPOSITE, AND LEAD TUBES, FOR GAS AND WATER,
AND EVERY DESCRIPTION OF
GAS AND WATER FITTINGS.
THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.
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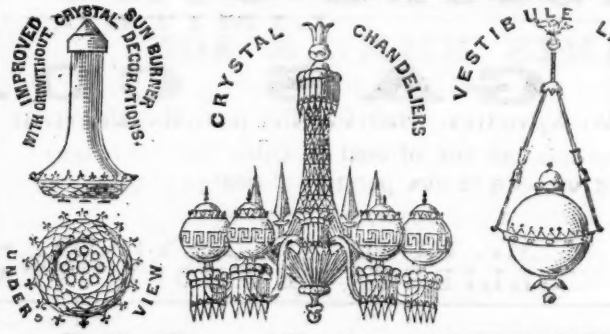

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